

**Office of the National Coordinator for Health IT
Federal Health Architecture
Provider Directory Workshop
Draft Transcript
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Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

It's always fun to get the skinny on NPPES from the folks in the know. After that, between 2:00 and 3:00, we are going to briefly go over past meetings and initiatives, we started a lot of provider directory workshops and boot camps where done five years ago, it's been going a long time, like not to repeat the past, like to make sure that we're moving forward and we are an optimized organization.

After that we'll talk some about standards, we'll talk about UDDI, HPD, service provider directories and FHIR, and after that we'll have a demonstration and some other discussions.

How we got here today, the final rule for the 2015 Health IT Certification came out, we had proposed a healthcare provider directory query request and a query response using the HPD standard and you commented, we heard. Everyone agreed provider directories and the ability for EHRs to query provider directories is valuable and there are many, many, many use cases beyond EHRs and provider directories, which is why we have a big tent here today, many other folks are involved in the use of provider directories.

Most commenters stated that they felt the standard was immature. Commenters also noted issues about data quality; folks said we should be using centralized directories that there needed to be a governance model for those, uniform directory sharing strategies. And others noted approaches using a RESTful architecture. So, we did not adopt those standards but we noted HHS remains committed in furthering health information exchange and interoperability, part of that is provider directories. That commitment is part of why we are here today. Continued work in this space to inform the development and implementation of provider directory standards, again, why we are here today.

Then, subsequently an interoperability roadmap was published and that also referred to healthcare directories and resource location, a glide path from moving from current provider directories to future resource location techniques. An interesting idea and obviously...I'm not sure we have all our provider directory ducks in a row and we're looking forward to the future. So, it will be interesting to hear all your thoughts of where we are today and a whole slew of call to actions that I'm not going to go through you will find those in the interoperability roadmap.

So, we're convening public and private stakeholders looking at success stories, batting around new ideas. We are pivoting on IT standards here. We recognize well that technical standards alone are insufficient to solve this problem and we're certainly going to listen to everything you have to offer about governance and sustainability, and all of those other issues that surround provider directories.

We're probably not going to hit them all, we are going to pivot on technology standards only because we need to have some focus otherwise if we go down every possible provider directory route we won't be anywhere at the end of the day and to facilitate a productive dialogue that will catalyze stakeholders to take action and with that I will introduce Steve Posnack, Director of the Office of Standards and Technology.

Steve Posnack, MHS, MS, CISSP – Director, Office of Standards & Technology – Office of the National Coordinator for Health Information Technology

Tough opening act, cool, thanks, thanks everybody for joining us today. So, I'm Steve Posnack again, on behalf of ONC and FHA we welcome you to two days of provider directory discussions. I want to thank Dan and Rim, and the FHA team for putting all this together, it's been a lot of work, a lot of preparation since the origin of this idea to being here today. Thank you MITRE for hosting us.

This is something that I've started to call catalytic convening and we hope out of the next two days that it's not just a repetition of the past, people hear updates, Facebook wall posts, etcetera about what's happened recently in your provider directory world, but instead we move beyond the past discussions and look forward to what it is that we need together and in part trying to craft my remarks it's been a real challenge to figure out what would be motivating for you all to start the meeting off.

But I think one of the things that struck us as we were talking about the pre-work here, there's a sense of urgency that I think we all feel now compared to even a year ago or two years ago, or some of the years past when these types of sessions have been tried. We have new implementing legislation, there's MACRA, there are a number of other ACA-related implementations you'll see from the colleagues that we have in the room both on the administrative side as well as on the clinical side, there's a lot of crossover and convergence that we're seeing.

As we look at the directory and resource location challenges that we have ahead of us one of the things that I think is becoming more clear to us is that no one can afford to do this alone but everyone can benefit by doing it together and so managing our own separate directories and dealing with all the other issues that got raised on the previous slides about quality and scale and the time, and the maintenance is something that may have worked in past years but as we look forward to the future it's likely not to continue to scale and work going forward.

So the challenge for you all today in getting the right ingredients together as part of our convening is to help you help yourselves and help everybody else make some progress in this area because as it got framed in the roadmap as your comments fed into it it's a real important infrastructure piece for health IT, it's something that we should be able to take for granted and leverage and innovate on not to compete on necessarily and it's one of those kind of aspects of the interoperability pie or puzzle that we can all benefit from working on together.

So, that's a little bit of why we want you here today, what we hope to get out of the next couple of days, and we'll have some interesting presentations in the beginning about what's going on in the field but we hope as we look toward to tomorrow the creative juices will start to flow, people will have ideas.

If there are connections that happen here as a result of getting everybody together that's a positive outcome for us. So, if you meet other people that are working on a challenge or, as Dan mentioned, you go have a side-bar and then you can look back a year or two from now and say "it happened there" that's a positive outcome for us.

We're not here to demand or derive a particular solution for ONC, it's more for how we can help the industry move forward on what is a multifaceted, multi-partner public/private issue and that we all have some skin in the game on this. So, I will end my prepared remarks here and turn it back over to, I guess Rim now, right?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Yeah.

Steve Posnack, MHS, MS, CISSP – Director, Office of Standards & Technology – Office of the National Coordinator for Health Information Technology

Thanks.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thanks, Steve. So, just a couple of other things, I'm Rim Cothren, you are going to get stuck with me for a lot of today but luckily you don't have to listen to me talk very much, at least that's my hope. My job is kind of to move us forward through the day and I'm expecting you folks to make it really hard for me to do that.

We do have a lot of stuff to present today but I'm hoping that this is an engaging discussion today, I'm hoping that people have things to say, especially tomorrow, tomorrow's largely unstructured and so there's lots of time tomorrow for us to talk about stuff.

If we had this all fixed, if we had this all solved we wouldn't need to come here today and all sit in the same room and there wouldn't have been people clamoring to get in at the last minute. So, I think that we recognize that there is a problem here for us to solve and I hope that collectively we can get there.

Today's task is to give us some background so that we all have a common understanding of some of the places we've been, some of the issues that we've found, some of the things that we've learned, some of the things that we're planning to do in the future, you're not going to hear everything today because it would take more than a day to get through all of that and that's probably as it should be at this point, we're still trying to discover what provider directories mean and what it is that we're trying to do.

But one of the things that I will say is that on the agenda it says that I'm going to talk about a definition for provider directory and I'm going to resist doing that because I think that if we come into the room and think providers, and I know what the definition of that is, and directories and I know what the definition of that is and that's all we're talking about today we probably won't get where we need to go.

So, I would challenge everybody to think big. When we say providers we're talking about every definition of a provider that you can possibly think of and in fact maybe providers aren't the entire scope, so we should be thinking about that too, okay.

And directories, are we just talking about white pages or phone books, or what and I don't know what the definition of directories should be here today but we're really talking about moving information about people around and think broadly about that.

I would challenge people to also think broadly about the stakeholders that are engaged here. Are we talking about something only that providers use? Are we talking about something that the larger stakeholder community uses? Are we talking about things that patients are using as well? We don't know the answers to all of those questions and I think that by the end of tomorrow hopefully we're getting some common understanding but we may not get all of the answers tomorrow either.

So, like I said, I'm going to resist the idea that we're going to define provider directories today, but at least we'll start to get a picture of what everybody is trying to do or at least some fraction of the industry is trying to do and what their definitions are and what it is that they're trying to accomplish.

Because we are broadcasting this, it's a small room, it's going to be tempting to stand up in the room and just shout because yes you can be heard in the room, you can't be heard over the broadcast so I'm going

to be wandering around with a microphone, please use it, so that means stand up and holler but that should not be an impediment for talking today. I am hoping...we need to keep ourselves on time, but I really hoping that people will talk today. Also, write down things and talk a lot tomorrow. As I said, I'm counting on you folks to make my job hard, don't disappoint me there.

Is there anything else that we need to start people off with today Dan?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

So, again, speakers if you could keep track of the agenda and be ready and on deck that would be good. And Stacey over here can answer any speaker questions before you present. Again, all of you in the room and on the virtual presentation, because there are a lot of presentations today, keep track of your ideas, send us your thoughts afterwards we'll get them up on the right board, get us your comments, if you don't get your voices or if you think of something afterwards just e-mail us.

There will be a report coming out from this meeting. There will be follow-up activities as a result of this meeting. Our acting provider directory website will be at this location and information will be there until we can get it into the proper healthit.gov location. So, with that we are going to go right over to Britteny and Karen. And presenters just press the down button here when you are presenting and that will move the slides forward, if you need help you'll find me in the back.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thanks, Dan. So, our first little group talk here is going to be about some state implementations or plans for implementation. Britteny Matero joins us from Oregon, she is the Director for Oregon's CareAccord and Karen Hale, joins us from Oregon as well, is an Analyst in the...I never can remember the name of the organization, the Oregon Health Authority.

Britteny Matero – Director - CareAccord

Health Authority, yes. So, we are with the Office of Health Information Technology, good morning. I am Britteny Matero and I'm the Director of CareAccord and the Medicaid EHR Incentive Program, and with me I have Karen Hale and I'm sure she will introduce herself when she gets up to the microphone.

So, today we just want to go over a few things with you. We want to start out with talking about a small effort that we started as we know provider directories are a lot more than just Direct addresses, but we are going to start with talking to you about our flat file directory.

So, CareAccord is the Oregon Health Authority Health Information Service Provider HISP. We began our services in 2012. We were the first state HIE to become the top EHNAC accredited; we are very proud of that fact. We offer web portal Direct secure messaging services and we just started into EHR expansion.

We began offering a no cost flat file directory in the summer of 2014 and it is administered through our CareAccord Program. We really started our small flat file directory in support of eligible professionals and eligible hospitals that were trying to meet Meaningful Use requirements. We wanted to expand the discovery of Direct addresses which was a challenge at a local level and we also wanted to support Oregon's statewide Direct secure messaging, which is something that the Oregon Health Authority is a proponent of.

We started this really at the request of our stakeholders out in the community. We developed some requirements, they must be with a DirectTrust participating HISP that is EHNAC/DTAAP accredited and they had to sign a participation agreement.

On a monthly basis we actually export, have our participants export an Excel flat file; it is really very, very basic. We compile all the Direct addresses and we ship it back to our participants. We scrub the data; we make sure that it is as clean as we can get it.

It is not a public directory it is really just for our participants and we call it our interim inelegant solution that's our stop gap while we wait for our statewide provider directory to come on line.

Again, really basic, Excel spreadsheet, it was just our solution for trying to get that discovery going while we waited for other directories to get up and running, which we are really excited to be here and to talk about what is going on.

Some of our successes, we have more than 4000 Oregon Direct addresses, 25% of those do not have NPIs associated with them. We have 13 participant organizations that represent a broad swath of stakeholders. We have our HIEs, our Regional Healthcare Services, clinics, pediatricians. We have more than 250 Oregon health care entities that are represented by the 13 participants, nine different HISPs, all interoperable, and our participants share that, yes, they are finding that with directory they are able to better meet their Meaningful Use requirements, specifically around those summaries of care and that they are finding that they have enhanced and better support when it comes to care coordination for their patients.

And then, actually beginning in April we will be adding to our directory some Washington Direct addresses because we are looking at how do we expand to our border states and really work on those care coordination pieces.

This has been a really learning opportunity that we've had and it is feeding into what we're doing at the statewide level. Some of the challenges that we found with the flat file directory is that there are a lot of competing projects out in the community, people that do not necessarily make a directory their priority because they have other IT needs that are up and coming, they have not chosen an accredited HISP, they do not understand the value in having a directory and able to be able to find each other.

We also find that there are challenges with EHRs and that NPI requirement in order for Direct addresses to be in the directory. For us we are very passionate about who are the care coordinators and a lot of times we are talking about the scribes, clinic managers, those that do not necessarily have an NPI associated but really are so critical when it comes to whole person care.

We also have found that the standards between different EHRs have been a challenge and care summary formats are not supported by all systems some of the things that everyone in this room is quite familiar with I'm sure.

Also, again, going back to that NPI, there are different definitions around who all really should have a Direct address and be able to send information back and forth when it comes to a client or a patient.

Facility level addresses, we have seen a lot more organizations that have gone to facility level addresses instead of individuals wanting to have one entry point when it comes to care and so how do you represent that when you are representing a directory.

And then co-located providers, so they might be working at different levels, different facilities but they have on Direct address and so how do you represent that when you have a directory and you want someone to be able to send to their professional at one clinic and that Direct address is only associated with them and it could go to various clinics in its routing. So, some of the challenges that we've seen.

So, what is next is we know that we need that state level provider directory that includes Direct addresses. Direct addresses need to be known, made available, searchable and that there is a value add when Direct addresses are included in a provider directory. So, this kind of simple inelegant solution that we have is really helping to inform our statewide provider directory which I'm going to now turn it over to Karen to talk about because really that is why we are here.

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

Hi, so I'm Karen Hale, I'm the Lead Analyst on our state level provider directory also known as our more elegant solution or the What's Next.

So, our goal for the state level provider directory is to provide healthcare entities access to trusted accurate provider and practice setting information and that is to support three key uses and these are kind of the...so the first is efficiencies for operations our health plans and our Medicaid enterprise are excited about this one. This is really about having one place to go for that valid information.

The second is all around health information exchange. So, that is really around having kind of that one stop shop to know where to go to find providers to coordinate care.

And then finally, a resource for healthcare analysis, this one is a little bit different. This is about having a rich set of provider information that can be used when we're calculating our outcomes for value-based payment.

So, why are we doing this work now? In 2014 we convened with our Oregon stakeholders, namely our Medicaid Coordinated Care Organizations or our CCOs, and they identified the need for a foundational health IT services and provider directory was listed as one of those foundational needs that they needed across the board.

The CareAccord flat file directory serves a very specific need but as Britteny talked about that was really an interim solution. This is the next level. Meaningful Use requirements, which are not going away any time soon, requires the ability to find providers to coordinate care.

Of course our analytics use of knowing where and when provider's practice is essential to get to understanding those outcomes and be able to attribute those providers in knowing where they were practicing and when they were practicing to be able to do those outcomes and that analysis.

And then finally, there are penalties for having inaccurate provider directory data. We also have reliable data sources to leverage.

Oregon Senate Bill 604 in 2013 passed in Oregon and it established the Common Credentialing Program, that program basically it sets up a database for providers to enter their credentialing information into, it requires credentialing organizations to use that information and what we are very excited about is it

requires providers to go in every 120 days and attest that this information is still valid. The provider directory in Oregon will be able to leverage that information.

We are also looking towards the HPD standards to connect to other directories so you can see I have a question mark on there because we are still trying to figure out a little more about HPD.

And then finally, we do have the authority to charge fees. So, Oregon Health Bill 2294 that passed in 2015 gives our office the ability to expand health IT services beyond just what we can offer within the Medicaid enterprise and charge fees.

Our concept, and I could spend 45 minutes on this, but I'll just focus you on kind of the centered square which is what we are procuring for, so we are looking to procure for a database to store information, a web portal for providers to view information as one of the methods of how they can view information from the provider directory and a hub as a method of how we can connect to other provider directories.

On the right side we have our flat file data sources starting with ones we know for sure which is common credentialing and we are exploring other data sources now.

And then over on the left side we have our users of the provider directory and who you do not see are consumers. So, we are still looking at this to be a service for our healthcare entities only. Users have to have authorized use to get into the provider directory.

And then one other box up above is we have an HIE/HISP because we do expect that users would be able to access the information either by looking up information in the web portal, although we have heard that this may not actually be how most users will want to find data in the provider directory, they would rather be able to get to the provider directory by going through their own health IT solution that they have where it is within their own workflow or getting...if we are talking about analytics, they are looking to get a large extract of data that they can then use to do the work that they need to do.

For our principles, that was kind of a big huge scope and so we do have our principles that we want to build incrementally to ensure success but we know we have to have value out of the gate. We do not want stops and starts to this project. We do not want to start on day one, providers go in, they find that the information is not usable so they never come back, but that is a tricky one for us because we are still trying to get to what is that magic point of what is value out the gate and building incrementally from there.

We want the solution of course to be scalable, to be able to meet that first principle. The third point about quality of provider information, this is something that comes up in just about every discussion that we have with our stakeholders, the first thing they talk about is that provider directories, if the quality of information is not up to a certain level then they are just not going to use it.

We are working in collaboration with our Common Credentialing Program, which in fact is within the Office of Health Information Technology and makes it easy to do. And then we are looking to centralize

where needed but to allow for federation of existing provider directories. So, kind of looking to that HPD standard, we are building off of that, and then really the key piece also is that we are looking to leverage existing data, but we do not just want all existing data we are looking for authoritative data. We do not want to be a big garbage disposal of data and we are going to be a little bit picky.

Procurement and funding, so the state level provider directory is part of our health IT portfolio. Other HIT services include the Common Credentialing Program as well as the Clinical Quality Metrics Registry.

Harris Corporation is our system integrator and they are responsible for making sure that those three projects work well together and that they are responsible for the procurement and overseeing the implementation.

The procurement is for everything including the kitchen sink, the technical solution. The second piece is kind of the big one which was not represented on my other slide, but the data validation and data management piece, which we know is huge and then program operations and ongoing management.

Then the last point is about our funding, so Medicaid funding has been secured for the design, development and implementation and then we will be requesting funding through a funding request for the ongoing management and ongoing operations piece that applies to the Medicaid portion. For the non-Medicaid uses and non-Medicaid piece that will be supported by fees.

Our current activities, the big bucket, are all around engaging stakeholders. The two points that I will bring out, because it is a lot of my world right now, is the first bullet point we have a PDAG. We wanted to call them PDOG at first but we thought PDAG sounded a little bit nicer. They are 15 member external groups comprised of our hospitals, providers, clinicians and we meet monthly for three hours, we talk about technical, policy, programmatic aspects. Most recently, we just got through a session on fee structures. The great thing about this group is that they do not have to agree on anything. They do not have to really get along, although they do, we just want them to provide as much information back to us as they possibly can.

And then our internal group, so within the Oregon Health Authority and Department of Human Services Agency, we have met with about 16 groups since December, I have “and more” because every time we meet with someone they usually bring up in that meeting “well, have you talked to this group, and this group, and this group” so we are still adding to that. They have identified what needs they have for a state level provider directory and they have also advised us on what data sources they have that are authoritative that we can use in the provider directory.

The other big piece we are working on is procurement. We are working on our business requirements, we have those baselines, those are still being refined. We do expect to have an RFP out later this year. And then finally drafting a business plan, so this is kind of the catchall for all that other work that we are working on now and I ran off the page on exactly what that all entails.

For our challenges and next steps, at the very top of the list I have HPD questions. So, our Oregon uses go beyond what is anticipated in the HPD standard. One of those pieces is the analytics use, so we need to know when a provider was practicing in a certain location, we need those start and end dates, which are not currently in the HPD standard, so we know that we need to extend that piece.

There is also a question about widespread adoption of HPD. So, we want an interoperable solution. We do not want to be building another silo'd provider directory and so we are wondering, how will we be able to be interoperable with other provider directories if we are not all speaking the same language.

Then other standards that are applicable, so FHIR and Care Services Directory are...how can we fit those in as well, do we need to?

We have questions about our fee structures and knowing who will pay and how much.

We are establishing the phasing approach that has been a little bit of a trick so we need to know what is going into the first, second and third phase and how those go forward, our scope. So, I showed you a slide about all the things that we are looking to do.

Our health plans want the provider directory to have the capability to track things like accepting new patients but then when we talk to other stakeholders they said that is an extremely tricky thing to do, we do not know if that is actually the work of the state level provider directory, so, keeping all of those things in check.

We also have, it is about as fun as it looks, we have a stage gate process in Oregon; it is a very lengthy process. We have gone through all of the appropriate approval pieces that we need to but it took a very, very long time to do that.

We have other competing provider directory initiatives going on in our state. So, as we have these lengthy contracting processes that we are going through and approval processes we also have other kind of silo'd provider directory efforts going on and then finally running off the page, establishing our governance model and structure. And questions?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

I have a question for you, you talked a little bit about data quality and I think we are going to be talking a lot about data quality today and tomorrow and mentioned penalties. Can you talk a little bit more about how you are thinking about dealing with data quality in the directory?

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

You bet, so we know that this is going to be a piece that we are contracting for. What we are thinking of doing is actually assigning...there are a couple of components, one is assigning a data quality score to

those data elements, when those data come in from an existing source is having basically a scoring piece that goes in and looks at things like the data elements, where the data are coming from and assigning a quality score. That score will be something that will be visible to the users so that user will know whether or not they can actually trust those data that are coming in.

We have heard, depending on the type of use that we are talking about, our health plans, when they are looking at validating their directory, they really do not want to have to make a decision about the data. They want to just know that it meets a certain standard and they can accept it as valid.

When we talk to our folks for an analytics use they are much more tolerant of maybe less than ideal data and they want to have more of a...they want to make that decision on whether or not they accept those data.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Thanks, great presentation, very well done. You are really on the ground and you have been working on this for a couple of years. Could you comment on the spectrum from the perspective of the users of direct exchange going from local to statewide? How much of the need in your community and your state is for people who are looking for parties that are in their same locale and then what are the projected needs for a broader statewide availability of this information?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

And that was David Kibbe from DirectTrust and the one thing I forgot to ask was that people announce themselves when they ask a question. Thank you, David.

Britteny Matero – Director - CareAccord

That's a fabulous question, thank you, Dr. Kibbe. So, we talk about we have the 4000 statewide Direct addresses that are currently in our flat file which all of the participants have said that they are just waiting for the statewide directory to be stood up and they plan to participate.

We did talk with all of the hospitals when we stood up the flat file directory and they all have said this is a need, we do not necessarily have time to do the work ourselves right now which is the flat file is a very manual process but they all are very interested in being able to participate in the statewide directory.

We also are seeing kind of those fringe, the behavioral health specialists, long-term care, those who work with the providers when it comes to care coordination who really want that statewide view and especially in some of those areas where they do not necessarily have a lot of access to the Direct address names.

So, I think that we will actually see quite a bit of participation at the statewide level when it comes to Direct and then we mentioned the border states as well, there is a lot of interest in what is happening right, how do we coordinate care right across our state border as well. So, both that statewide expansion of Direct and also the border states piece as well.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Go ahead, Jeff?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Hi, Jeff Livesay from the Michigan Health Information Network. Karen or Britteny, great presentation. This question is about your statewide provider directory that is upcoming. You had a lot of emphasis on Direct addresses, but as we all know there are other forms of electronic addresses some providers want information to go directly into their EHR with IHE routing number or now you can send to a FHIR server or a resource for that provider, or secure text and other forms of electronic addresses. When Susan Otter presented your progress with the EDIs and the ADTs are you contemplating that the state provider directory will store the other types of electronic addresses and routing preferences for providers?

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

That is an excellent question. So, out of the gate we are looking at kind of what is that low hanging fruit and still trying to figure out that piece, but we know that there are all of these emerging efforts and additional efforts going on so we have built room in our implementation for being able to not just be limited to Direct secure messaging addresses and the trust information that is needed to know that you can kind of trust that information and have everything you need.

Echoing

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Just underline that.

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

Exactly, but we do know that there are those other pieces of information that we need to have in the provider directory, it could be...we know that there will be additional fields needed and that is where we kind of get to that HPD can take us so far but we know that there are other things that are needed for us to kind of complete the work of the provider directory and not build ourselves into a corner that we cannot get away from later.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Thank you.

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

It is John Donnelly with InterPro Solutions representing the EHR/HIE Interoperability Workgroup and ConCert Initiatives, just a quick understanding of what you see going forward from the current environment to the statewide.

Today I would identify your current solution as one of replication of database entries to both HISPs and EHRs, etcetera. Are you anticipating that the future world would be more of a single access than single point of access to the directory from the EHRs and HISPs and replacing the replication concept totally?

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

We would certainly hope so, that has been one of the things specifically that our stakeholders are telling us is that just having providers work within the flow of their own solution and not have to go to additional points to get to the provider directory that they are all working through kind of one method, one way, providers are not having to put their information into multiple systems over and over again or being asked for this information over and over again that it is just one...on multiple levels but kind of reducing that burden of kind of multiple ways of getting this information in, cleaned, accessing and request for the information whatever that happens to be.

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

Just one other question, are the payers or health plans currently involved with the provider directory exchange?

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

In the flat file they are not.

Brittney Matero – Director - CareAccord

They are not.

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

They are not in the current flat file exchange but they are definitely on the roadmap for the state level provider directory and they are a huge piece of the external workgroup that we work with. They represent...at least 1/3 of those members are part of the plan.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

I know that we have a few questions online and there are more hands here in the room. Why don't you read off one of the questions online real quick while Amy and Elaine come up for our next presentation and then what I am going to do is pass around sticky notes because I know that there are more questions here and if you can scribble down what your question is we will post them and we will make sure that this is stuff that we can get to tomorrow. Does that sound reasonable? So, one question online?

M

Okay, the first one was a comment, so let me get that one out of the way because I think it is descent. It says, technically, this is from Peter Bachman; technically HPD is not a standard but an IHE profile. There are Internet standards for directories like LDAP, ISO standards like X.500 on which LDAP is based.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Well and so we have a session this afternoon we are going to talk a little bit more about standards, let's make a note to kind of come back to that and position where HPD is and some of the other profiles associated with that, we will make sure that we address that this afternoon. Okay, so let's make sure we do not lose that one and then I know that you had some other questions, why don't we make sure that we get those on sticky notes also so that we can move forward. All right?

I told you that I expected people to give me trouble, I'll let you give me trouble here for just a second and I'll take it out of my own speaking time later on today. Quick.

John Rancourt, MPA – Deputy Director, Office of Care Transformation – Office of the National Coordinator for Health Information Technology

...

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

No you don't get a microphone.

John Rancourt, MPA – Deputy Director, Office of Care Transformation – Office of the National Coordinator for Health Information Technology

You can hear me? Okay, Karen and Britteny, thank you so much. My name is John Rancourt, I'm with ONC, I have been working on provider directories for four years or so. So, excited to see all of this interest and wanted to start by thanking the folks from Oregon for all of the work that you guys have been doing, your contributions that you have made to the work that we have been doing. We recently put out a provider directory state guide, a state implementation guide that was driven a lot by the work that our friends in Oregon have done but also Rhode Island, we are going to hear from Amy as well that the vision that they put forth the efforts that they are doing is so exciting.

I did want to ask you, you spent only a second talking about the PDAG and I wanted to ask if you could talk just a little bit more about that since I think we cannot underscore enough how much this has to be a collaborative process in order for us to find the shared value and then create enough value that allows for additional use cases and like the use cases that you have laid out. I know how much time and effort you guys put into that and the different work products that have come out of that. If you could just talk a little bit more about that and refer people to your website, which is also a great resource as well. Thank you.

Karen Hale – Lead Policy Analyst, Office of Health Information Technology – Oregon Health Authority

You bet, so we starting meeting with our PDAG back in April of 2015, we have met with them...those folks that participate are part of a...we have a Regional Health Exchange, we have the Oregon Medical Association, we have hospital executives, health plans and our coordinated care organizations who all participate. We started with meeting with them, we said that they would be two hour meetings every month, it was not enough and so they all wanted to meet more often and have longer meetings, which is really rare, so we meet with them monthly.

We are taking our first vacation month or spring break just this April. So, we have met with them consistently for over a year and the work that they come up with...so we do not give them a lot of homework we just want them to come prepared to talk to us and any kind of an artifact that would come from those meetings are all available on our website. Everything seems to take a little bit longer than we anticipate with them.

The first thing that we had out there initially was, tell us about the uses, how are you going to use the provider directory. And we thought that we were all on the same page because we had met with this group, a similar composition of this group, back in 2014 and we realized very quickly that everyone was kind of really thinking about different things, saying one thing but really thinking that the provider directory might do something different than what we were actually talking about. So it actually took about three meetings to develop kind of the as is, to be set of analyses and also come up with a very high-level of use cases that they all agreed on.

The group does not have to agree on everything but at least getting those common concepts out of what it is so everyone is kind of speaking the same language when we are talking provider directory that has been kind of a huge piece of the work that we have been doing.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you. If anybody needs questions to write down raise your hand and when we are done. Thank you very much for speaking with us today. Our next speakers are Amy Zimmerman, the HIT Coordinator coming to us from the Executive Office of Health and Human Services in Rhode Island and Elaine Fontaine, Director of Data Quality and Analytics from the Rhode Island Quality Institute.

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

Thank you, Rim. It is a pleasure to be here and what Elaine and I want to do is...I am going to give you a little bit of context setting and history in terms of how we got into the project that really has, to date, been a partnership between the state, I'm at the Office Health and Human Services, and Elaine who works at the Rhode Island Quality Institute which is our state designated HIE entity.

So, just to set the stage, we do have a health information exchange known as CurrentCare it started in 2004. The Quality Institute was designated as a Regional Health Information Organization by our state law and then we passed some legislation in 2008 and that required an opt in model, and this is important

because this is part of the framing of how we got into a provider directory, because our opt in model in Rhode Island means that individuals have to say they want their data to become part of the HIE, they also have choices in who can view their data and access it, but in accessing it we need to do it at the organizational level because of cross coverage and other physician issues.

So, at some point we needed to be able to know which physicians worked together in which practice settings for the Quality Institute, for the HIE, to be able to implement the consent model. So, this is part of the reason why I am putting it here is sort of framing the history of how we got to where we are.

And really then in around 2012 and 2013 we were part of what was called the Trailblazers Initiative, a couple of other states, this was funded by the Office of the National Coordinator through NASHP and it really was to help states that were a bit advanced in health IT technology align their HIE activities and sort of get ready for value-based purchasing and healthcare reform. In some ways it was a little bit of a precursor of doing HIT work before the state innovation model work that is going on now across the country.

So, through our Trailblazers Initiative, and by the way I just want to say that at this point in time Dan Chaput, who is now with ONC, was in Rhode Island working with us and was heavily involved in the early thoughts of provider directory so it is no surprise that he has stuck with that with ONC. I do remember him sitting... actually I still have presentations he put together and white-boarding things as we put a state workgroup together at that point in time.

But through the Trailblazers Initiative we identified many of the needs that Oregon has stated so eloquently, actually it is kind of nice that we are following Oregon because you are going to see we have many of the same goals and objectives, I think we are a little bit... we are further along in terms of the implementation aspect of achieving what they have said.

So, we recognized that we really need to know providers and their relationships to organizations and entities in addition to their information and Direct addresses. We had a lot of small directories all across the state government and across the state and we put together a workgroup mostly of the state level folks at that point and the Quality Institute to identify use cases, though this is no surprise this is probably what it looks like in a lot of states or locations, of where the provider directories all sit and how disconnected they are or some semblance of provider directories.

Through the Trailblazers Initiative we were able to get some technical assistance and ONC offered some help through Audacious Inquiry, they came, they did a site visit, they met with a lot of the stakeholders, they made some recommendations and what they recommended was that in our case that we implement a single centralized provider directory database to serve as sort of the source of truth and they sort of recommended two options, one that we leverage the work that was already being done through the Quality Institute, again, to help implement our opt in consent model. They were found to be the furthest along in this work so it was felt it would be potentially the least expensive and most expedient.

The other option was to co-locate the provider directory on the platform with our state's insurance exchange and integrated eligibility system for human services and so ultimately that is a better picture of where we are trying to go.

We became a SIM state in 2014 and 2015, we still are a SIM state and there was a formal decision to build the statewide provider directory leveraging RIQI's work to date and we are contributing some money from SIM now to get this operational, deployed and implemented.

So, as far as governance, because that came up, and then I will be turning this over to Elaine to talk about actually the work that RIQI has done and where we are in the implementation, we did have an advisory committee to the Quality Institute, it mostly included state agencies in the Quality Institute initially including folks like myself from our Office of Health and Human Services, the Department of Health, our insurance exchange and also representatives from our all payer claims database, because again, they get provider files and that actually is run by an interagency workgroup from the state, and we have started to bring in practicing providers and payers because we are building this in a way that need to meet their needs.

RIQI now is actually formalizing, as a more formal committee through their governance structure, a committee actually they are presenting a charter to their board tomorrow morning, which again, will broaden the group to additional stakeholders.

Elaine Fontaine – Director, Data Quality & Analysis - Rhode Island Quality Care Institute

Thanks, Amy. So, Amy set the stage for everything, while she was doing that I was actually working at a large integrated delivery system living the pain of having six provider directories in my organization and not knowing the things that I needed to as the person who was doing analytics knowing when somebody was where and when they moved from being there to somewhere else, because as I was working through value-based payments and Pay-for-Performance on a physician level we just did not know how to manage this. So, I was excited to interject myself into this process which was not part of my original job description when I arrived at the Quality Institute two years ago.

I think these goals are not dissimilar to the goals that others have around basically being able to know when somebody is where and keep track of them. I do want to just caveat everything that I say to say that I am not the technical FHIR guru, so those questions I will look a little bit like a deer in the headlights if you ask them, but we will go back and ask the folks who do know more about that.

What I can tell you is that looking at the basic standards of HPD we realized that they were not going to be expansive enough to meet the needs of our community beyond just the needs of the Rhode Island's quality consent model but really to be able to support the health insurance exchange and that means knowing not just who a provider is and what organization they are affiliated with but also how they are contracting with a variety of organizations. And so when I arrived we really spent a lot of time talking about the data model so that we would be able to accomplish the things that we needed to long-term.

So, the challenge, as folks have alluded to, is really around not just knowing what the data model needs to be but getting the data quality right so that if we could actually do this once do this in the center and do

this incredibly well the goal would be to be the single source of truth for the state and provide people with a lot of value.

We actually, at one of our board meetings the president of the largest hospital system in the state banged his hand on the table and said “we are in vehement agreement that this is a really giant need for the state.” So that is a good start if you are trying to move things forward. So, our goal is to manage the directory as a single source of truth for the organization and for the state as a whole.

So, I told Amy I liked this slide so I’m keeping it in but there is nothing here that none of you don’t know that one provider has many relationships, you’ve got a panel of patients, you’re working in multiple offices, there are multiple hospitals affiliated, you might be in an ACO with one of them, you are contracted with a whole bunch of health plans, we are measuring you on a whole bunch of quality measures, you are participating in a variety of programs and we care if you are participating in CurrentCare, which is our little world. But the bottom line is we need to keep track of all of those things with those start and stop dates so that we can do the analysis that we need to know in the backend to answer the question about whether or not the changes that we are making in our payment system are actually doing what we need it to do. So, that is my vent is always looking at the data on the front end and getting it clean so that we know that it is right on the backend so that we can effectively evaluate our programs.

So, this is our model and we are really looking at trying to look at a provider, and this is much more complicated than what existed in the product that was in place when I arrived, so InterSystems is our vendor and we think that they are going do very well with this model, they have learned an awful lot. The first conversation that I had, and I’ve told Amy, I was talking to somebody about provider specialties and they said “well, so, you know, like being an internist that is sort of like being a vice president at a bank right?” I was like “not exactly.”

So, we talked to them a lot about what the data model needed to be to accommodate the variety of relationships that a provider would have. You know you are working at one location and your contract looks different when you are working on Smith Street than when you are working on Broad Street and so being able to accommodate all of that complexity is really important and we think this data model does that. So, we are looking at not just the provider to the organization but the provider to the organization to the location to the payer and that adds obviously a much bigger level of complexity.

So the overarching concept of the provider directory in Rhode Island is to take in a variety of data files much like the HIE takes in a variety of data files and as they talked about in Oregon being able to assign a weighting or a value on a field level to each of those data sources as that which is most accurate. So, the obvious answer is that the NPI is going to have the most accurate NPI 99.9% of the time.

The payer is going to know who they are contracted with. The provider organizations are going to know who is actually on their staff at a given time and who is credentialed at the hospital and all of those data elements are around 400 or so, are actually all collected and an analysis of that data is made so that you can sort of say, okay, I’m taking this from this spot, this from this source, this from this source, and this from this source and therefore being able to come together with an aggregated single source of truth at the

end. And that is obviously not just all magic, I mean, there is an enormous amount of complex programming that InterSystems has engaged with us in just talking about what that looks like but that is obviously not enough because this data is so complex there is actually a big component associated with the value add that we see is that we are doing the mastering of the data. So, everything that falls out, and there is a reasonable amount that will fall out, you pull all those data sources together and then you are going to find the discrepancies.

And then we have a team of about six folks whose job it is, full-time, to pick up the phone and call the doctor's office and say "where are you, when were you there, which office are you really practicing in" and being able to manually update the data to keep it up-to-date day-by-day.

The other piece that Amy talked about really is the governance and I agree. I was listening and I was like PDAG, I think I might like that better than PDAC. We had a number of different discussions about what to call that group, but the governance is really important and it is not just about sort of assigning rules to which data source is most valid but we have started to talk to folks about the things that are going to be important to them in the end like who can see what.

So, we have been talking to payers about getting their data in and they were really kind of sensitive about it at first and we were not understanding why because everything we are asking them for is on their website. And so they said "but you're not looking at my entire network as a whole and that being able to export that and share that with my competitor. We feel like this is a competitive advantage." And we were like "well, sit on our provider directory advisory committee and engage in the governance process." We don't have to deliver a file that cleanly says to your competitor what your network looks like. The state already has all that information because they need it for the APCD and we are doing it on their behalf. So, that is not something that is not a reasonable request but how that is presented to others in the community is definitely part of governance.

We have some physicians who are really sensitive about their age and they do not want...as a consumer I might want to choose somebody who is closer to my age, but physicians do not necessarily want their age on a public-facing website so come to our advisory committee and engage in the process and I think that we have really started to pull those folks in pretty well.

So, all of this comes to being able to produce output files that are valuable to a variety of sources. This is a little bit of an eye strain, but basically you can conceptually see that on the left is the anchor record and then each source feeding that anchor record is identified and this is what an operation's person would be looking at for all of those data elements that we are collecting and they basically can run across and say, these agree, these agree, these do not agree, I'm picking this one, this is really not the same person I'm going to disconnect these two records to be able to accommodate getting a clean file that is a master file in the end. So, that would be what would be output. And the output will be controlled by the governance process.

So, the uses, we have the president of the largest integrated delivery system banging his fist saying "I need this because I've got six of these in my organization, none of them are right, we don't have the right Direct address so I'm sending things to the wrong provider, I've got the wrong fax number, things are

getting lost in the shuffle and it is actually impacting patient care.” So, we know that this master record will be available potentially as a file output to the hospital system.

Ultimately, we believe that it will be one of the things that we have planned is to have an application interface so somebody can just go and pull the information at times.

We know that providers actually, we have a provider advisory committee and we said “how do you guys imagine using this?” And they basically said “well, if I need to find a Spanish-speaking female cardiologist who lives in this town, who I don’t know, to meet the needs of this patient, who takes this insurance” you know that’s a lot of information for somebody to keep straight and know that it is actually accurate today as opposed to three months ago. So, that is their perceived need. We imagine patients might do the same thing and obviously near and dear to my heart is the need for analytics. So, hospitals, plans, patients, state agencies we think that the need is great across all of these entities.

So, where we are, this is probably more detail than you care about, so I am going to give you the upshot. We have finished the development of the product with our vendor. We are in our user acceptance testing phase and we have begun to do the data mastering and we are beginning to really sort of suffer through the real pain of the quality of the data that is coming in from these sources. And having conversations with the folks in operations they are like “well, this data is terrible.” I say “I know that’s why we need this project.” So, that is where we are.

We are pulling in data from NPDES, from a purchased database called Health Market Science, an internal database, and our largest integrated delivery system will be pulling in data from licensure, from the all payer claims database and from the health insurance exchange all of that is sort of planned before the end of the year.

We will be ready to export our first files at the end of Quarter 2, maybe beginning of July. We are focusing, as I said earlier, on those providers...you are focused on NPs, PAs, MDs, DOs initially but we know we’ve got a big need in the community around folks who are in behavioral health so the licensed social workers, etcetera, will be coming up very quickly behind.

We are working on the consent model as Amy discussed and we also will be bringing up a public-facing portal by the end of the year.

We are working on providers doing self-service and one of the things I wanted to point out, and I know that Oregon is working on this and I want to talk to them, every time we talk to people they say “but are you doing common credentialing yet?” And I said “not yet, but we know that you want that” and we know we need to talk to the folks in Oregon because we know that they have lessons that we can apply in Rhode Island.

So, what’s next, more on governance, we are operationalizing now, sustainability with regard to fees. We are also in the same place trying to figure out what the pricing model will look like and that is no small activity. So, we do know that there is demand it is just what people are willing to pay for that.

And my mindset is, there were 10 people at my large integrated delivery system whose full-time job it was to keep provider data accurate and it was never successful, so it seems like it is worth at least five FTEs to me. So, there is that. So, I'll turn it back to Amy.

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

Yeah, I see the red so I know we are out of time.

Elaine Fontaine – Director, Data Quality & Analysis - Rhode Island Quality Care Institute

Okay.

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

Real quick, we are trying to also align with some state legislative efforts because we have some legislation to require plans to do a lot of stuff and creating very specific provider directories making them available. We want them to be able to use and leverage the statewide provider directory so we have been in ongoing conversations so legislation came in from our Rhode Island Medical Society, we are meeting with them regularly to try to make sure that their legislation can allow plans to support the provider directory.

We are exploring Medicaid 9010 under the expanded funding to do some additional work on this. I think everything else here pretty much has already been stated, so since we are out of time I'm not going to go any further on that one. Thank you.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you. Do we have time for one quick question, maybe two? You said that you had one on the phone; do you want to read it real quick?

M

Absolutely, so this is from Jeremy Willard it was for Oregon, it is applicable to everyone, many health plans participate in multiple Medicaid Programs, curious to know how are you coordinating with other states? How do you come up with a single solution? How do we ensure we do not come up with 50 different solutions?

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

So, I think in large part that is why we are here. Our answer is right now we are very focused in Rhode Island trying to connect and build this for Rhode Island with the intent that ideally it would be able to connect to other state provider directories or other national provider directories, but we have not focused on the interagency state initiative other than the fact that some of the data that comes into the common

provider directory is for providers in other states because the commercial product has a lot of information that those, Elaine can speak to this, but the mastering of those providers other than those in border states will not happen, at least certainly not initially, although eventually we would like to be able to do that.

Carol Robinson – Principal – CedarBridge Group, LLC

Hi, Carol Robinson, CedarBridge Group, terrific presentation. My two questions, very quickly, are one, legislative alignment could you expand on that? Is that around network adequacy? And then the second question is around the licensure feed and whether you are looking at legislating or requiring regular licensure updates that would help keep the directory clean?

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

All right so we'll take the first one, the legislation right now that the medical society put out was a bill they put in last year specific because they are concerned about...with more limited networks they're concerned about making sure that individuals have enough information to make informed choices about who is and isn't in their network. Right now in Rhode Island most...we have a few major payers and most providers are in most payers networks it really has not been a problem.

So, the legislation they put in was basically requiring that all health plans have a provider directory and really articulated very specifically every data element that needed to be in there and a whole bunch of functionality.

We are trying to make sure...we want to incent the plans to be able to leverage the common provider directory and not go off and do their own thing especially since some of them have been a little skittish about sharing information, so what we are trying to do, and we'll see what happens, is actually allow the plans to, if they use the common provider directory, to have that...to serve as their approval and meeting of the legislation and then making sure that the legislation and the common provider directory have the same data elements and the common provider directory can achieve what the legislation is looking for it to do. So, that's the first answer.

The second answer, with regard to licensure, our providers are required to update their licensure and get a license every two years which is inadequate to certainly keep this updated. So, we are looking at trying to make the provider directory have a self-service component that...it is also right now written into the legislation, if it passes, that they would have to keep it up on some sort of regular basis.

So, I think there are different ways of doing that and thinking about other levers through licensure, but we know that when we require certain things like even filling out a HIT survey tied to licensure and providers had to attest that they had filled out the survey when they redid their licensure they just didn't do the survey. So, we are looking at what will get us furthest the fastest.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you. We need to move on. If you have questions that did not get answered we'll stick things on a sticky note. Next up is actually me so I can try to get us back on track a little bit. I guess that is my responsibility isn't it.

Along with helping organizations like ONC I have another hat that I wear and that's the Executive Director for the California Association of Health Information Exchanges. So, I am going to talk a little bit about what we are doing out in California.

The purpose of my organization is to fill a gap in that California does not have a statewide HIE and in fact the State Government in California isn't moving as forward with a statewide HIE. So, CAHIE is establishing a trusted network for exchange statewide through voluntary self-governance without regulatory authority. So, that is just a bit of a crazy idea in and of itself, but what that means is that an important component of what we are doing is establishing trust among organizations that do not normally do business with each other so that they'll exchange health information.

And just so that people don't start throwing fruit at me immediately, yes, this is going to be another talk about HPD, but it is not because I believe that HPD is the absolute best thing that I have to work with and it has some shortcomings and we are going to talk about those today, but because it was important to us to work with a national standard, and I would say that we need to move that ball forward some if we are going to really get to a point where we can share information, is that we need some standards by which we work. So, we are trying to make a national standard work.

As I said, an important part of what we are doing is really establishing trust and as a trust network that is our first priority. What that means is that we need to put in place a number of different business processes to make sure that information can move among organizations in a trustworthy manner and that's as simple as we need to make sure that the information is encrypted, that it is reliable when it is received someplace, that you do good patient matching so that you know which patient you're sharing information about, etcetera.

But a big component of this is knowing who it is that you're talking to and for us that is the role that the provider directories fill and in fact because we want to think about that broader and in terms of health information exchange and not necessarily just provider directory or excuse me provider information and provider identity we think of this in terms of directory services and we actually even avoid the term provider directories for that reason. I think that maybe something that we see as we proceed over the course of today is that we all have different ideas about what this animal is.

And this animal in California is a means by which we can, yes, find individuals and organizations but most importantly understand how we exchange information with them and that means that we are not just talking about "do we get a Direct address for every physician" yes that's an important component of it and in fact it is our first goal because it is a need that we have in hand that aligns with Meaningful Use, but it means that we need to understand how to exchange with individuals and organizations in a broader sense. If that means that I need to understand how to query Dr. Smith's EHR for a care summary how do I find that information because I don't know what HIO or even what EHR Dr. Smith uses so I need some way to find that out and that's part of what we are trying to do.

And as I said, we stray a little bit from calling this provider directories because we think of this as a set of directory services to support the network and that is the scope that we are trying to deal with here.

We are also, in some sense, trying to align ourselves with part of the vision in the interoperability roadmap and that was a call for locating resources on the network that I could exchange information through, and again, trying to align ourselves with how do I exchange information with individuals and organizations I need to be able to find those end-points whether they be web services, Direct addresses, whatever maybe someday aligning with discovering FHIR resources, etcetera. And so thinking about that larger picture is part of what we are trying to understand.

So, there a number of things that are part of what we believe the directory services should be. First, it must be more than just Direct addresses and not necessarily just because Direct addresses are insufficient that's a part of what we are doing, it is a real part of exchange and it is in front of us now, but it is merely a near-term goal and we need to expand beyond that and so we are trying to understand how we can use directory services to exchange...to service for exchange using other standards.

It must include context, as you have already heard, and as most of us already know, physicians have more than one place that they practice, more than one system that they use and therefore more than one place where they may need to receive or send information from and that means that we need to understand not only how to reach Dr. Smith but how to reach Dr. Smith at her private practice, at the clinic where she volunteers and at the two hospitals where she has admitting rights, because the answers to those questions may be different in all of those different context.

The information has to up-to-date and we also know that physician's change where they are located, what their relationships are and we need to make sure that the information follows along with that. We are exchanging PHI based on information we find in the directories and so therefore the risk is not insignificant if that information is incorrect.

And we need to prepare for more than just providers. Now today what we are doing in California supports exchange among providers but we want to be positioned so that we can deal with a larger stakeholder community because that ask is already happened. And as we have already been talking about this morning the cost of managing directories is high enough that if we can't share our resources and share our goals we are not all going to be able to get there all by ourselves.

So, how are we doing this? First of all, we believe that management should be distributed and for our solution it is. It is the best way that we can imagine in keeping information up-to-date is to make sure that it is populated by the organizations that are authoritative for it.

Since the focus our directory is on the exchange of information that means that most of the authorities that we are turning to right now are the HIOs or the EHRs that are providing those connections to the network and therefore maintain them and are authoritative for those connections. That means that although we

carry phone numbers, addresses, etcetera, in the directory they may be less accurate than the connection end-points, which is a limitation and a problem that we deal with.

Our architecture is federated not necessarily because it is the only way to proceed but it is a way to deal with distributed management and therefore organizations manage the directories that they also maintain physically and connect to a single directory source.

There are other mechanisms to deal with distributed management that we just have not pursued but we are doing a federated architecture instead. And we do have policies that govern use of information and that govern how information is placed on the directory.

We are using HPD and again we are using HPD because it is a national open standard and in fact we selected HPD at a time that in most...that many of the organizations in California that were participating on the network actually were implementing HPD and so it became a standard that was good for us to work with. It does have the mechanism to deal with electronic services if you choose a way to extend it and there is actually a more organized mechanism, now about how do we standardize, how we represent electronic information that Eric may talk about this afternoon.

HPD does allow us to talk about relationships and context for information so we can represent electronic end-points for individuals, we can represent electronic end-points actually for organizations such as a clinic and we can represent electronic services or end-points that are associated with that relationship and that context. It can also be used to do a very complex relationship. Now HPD is somewhat cumbersome in doing this but it can meet this goal because you can show very complex relationships within the structure and associate electronic end-points with them. So, that means that I can represent the Direct address of Dr. Smith at her private practice as well as the Direct address in the EHR where she admits patients.

We are doing this through participation in a federated directory structure that is part of the California Trusted Exchange Network. Most of the participants on that structure manage both directories and clients that can query the directory and it is a real-time query structure that we have put in place.

We support local autonomy of all of the organizations so they make decisions about what information they share but they are policies around that. So, that means that if I do request for you to dump your entire directory at me you have the ability to refuse to honor that request either for performance reasons or because you are concerned about people just fishing for information in the directory and that is an important part of establishing trust among the participants in the network.

We do have policies associated also with minimum dataset and so we have walked the HPD standard and identified how information in our directory will be represented, what information is required and actually have relaxed some of the standards that are...some of the things that are required in HPD and have enforced some additions to the HPD profile that are required in our own implementation. All of this information is available online if you are interested in finding out more about it.

So, how does it all work? You have some query client, and the query clients that are implemented in the state right now are usually HIE portals sent to the Direct messaging system. So, if you wanted to look up a Direct address you do that within the client that you are using now today. And that query goes to a central data-less service that knows where all of the directories are in the state, farms out queries to all of those directories that look for the right answers within themselves, pass their information to this central service where it is consolidated as if it were a single directory and passed back to the client that made the query.

That means that California appears to have one big monolithic directory but in actuality has several and those several directories are managed by the HIOs that are issuing the electronic end-points that they are then serving back up.

Now, I said before that HPD is what we are using today and it is something that we have in front of us, a specification that we can work with, and we are using it because it is open. It was adopted by industry at the time that we started. It supported the things that we needed which was individuals, organizations, complex relationships between them, potentially for a broad set of stakeholders and for all types of electronic exchange. But the truth of the matter is that is because we are already extending what HPD can do.

And maybe HPD isn't the answer, but something, some technical mechanism to represent all of these requirements is where we need to go if we are going to be able to migrate where we are today to the next step.

Now what I can tell you from what we have done so far is that we have essentially learned three things that first of all you can do a federated directory structure and I'm not going to do a demo here for you today, but I could show you how a query like the one that I illustrated on that slide can reach out and in a second or two get you answers back from all of the directories in California, this is something that actually can work.

Second, that HPD can do what we want it to do and that is that we can represent the information that we need, we can represent the complex structure we need and we can also implement a federated structure for it.

And then I can also tell you that HPD cannot do what we want. That was halfway through last year we had eight organizations in California that were participating in our directory, represented a lot of individuals and organizations on our network, we had a complex structure to get that information back from you. Today, we have two and what that means is not only is HPD not being adopted by the industry but it is being less adopted today than it was last year and so we have a real serious problem from standards moving forward and it is very difficult for us to move forward with any standard if industry is not going to adopt it.

So, one of the things that is really clear to us is that we need to make sure that if we are going to do a structure like this that we have a mechanism that is going to be adopted by industry to implement. And that's all for me today. I see we have time for a couple of questions if people have questions.

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

Hi, Amy Zimmerman from Rhode Island, so maybe you said this and I missed it, I apologize if I did, but if you are on the federated model and you are pulling data from the different directories how do you deal with discrepancies if different directories have varying information on the same provider? What ends up getting presented?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

That is an excellent question and it was one of the things that we were considering as we implemented our directory because that will end up happening sometimes but it happens because two different local directories have information on that provider and in theory information that they are authoritative for.

So, that means that Dr. Smith may have information that comes on a Direct address from the private clinic from the HIO that serves that clinic and from a hospital from the EHR that serves that one and what is received by the individual that placed the query is information on both of those. That means that you have the context of that information and hopefully, as an individual, can make an intelligent choice on which one is correct.

W

So, that...

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

But that is a real serious...

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

I absolutely agree that happens for data elements where there can be more...for information where there can be more than one. I think we have found that there are things even like, I don't what Elaine could say, like NPIs or other things for which there should be a single authoritative source but there is data errors in someone's database.

So, cumulative data, language spoken, hours open that's aggregate or that's cumulative or aggregated, whatever, you know what I mean.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Yes and I would agree with you. Can you just, for the record state your name for the people that are on the phone?

Amy Zimmerman, MPH – State HIT Coordinator – Rhode Island Department of Health & Human Services

Yes, I'm sorry, that was Amy Zimmerman again from Rhode Island.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you.

Justin Richer, MS –Independent Contractor, Founder – Bespoke Engineering, LLC.

Justin Richer, Bespoke Engineering, and first I want to say, really great to see an API-based approach here as opposed to just we are going to try to replicate a database or something like that. I really think this is where we saw with Rhode Island and with Oregon this is where things are going and it is really great to see you guys are building them out.

My question to you is, with a distributed system have you run into any challenges dealing with sort of right of access to actually make the queries? You know if I am making a query in the system does that mean that I have the right to ask everybody this question or do they need to know...might I only be able to ask the same query of some people but not of others or get different answers back? How are you guys managing that in a distributed architecture?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

So, it is a good question and part of the policies that we have put in place dictate some of the answers to those questions. So, first of all "yes" you are allowed to put any query out you want, it goes to the central authority and it will be passed to everybody within the state. So, that means that the same query goes to everybody. Everybody has the right to refuse to answer it. And so the local policy that they put in place for that directory dictates how they put in the answer. Quick question.

Jeff Eastman, PhD – Senior Architect – Michigan Health Information Network Shared Services

Thank you, Rim, Jeff Eastman, Michigan Health Information Networks, patient matching is a current hard problem that is being addressed by a lot of people and solutions are difficult. How do you do provider matching in a federate architecture?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

So, that is a good question too and actually we are not doing provider matching. What we do is we query down to every directory to do what that directory believes is a match for the providers or for the query that was in front of it. That query may be as simple as give me all of the dermatologists in a zip code and not have any request for a match on a name or it may have information about the provider that you are trying to get a match on a particular individual.

We do not do anything to consolidate those records as they come back up. As Amy was asking if there is incorrect or information that disagrees for more than one directory we present both of those and that does mean that human beings are involved in making decisions about which is the right person based on the context and the information they get back.

Okay, I've got the red card being waved at me so I need to move on. I will pass sticky notes around for other questions and I am going to pass things on to Jeff Livesay. Jeff is coming to us as the Associate Director for the Michigan Health Information Network. Jeff?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

We had a Jeff matching problem there with Jim Livesay. So, I am Jeff Livesay from MiHIN and I first want to thank Dan, Steve and Rim for organizing just a phenomenal event so far. This is so exciting. And Rim, I will say that in the years that I have known you this is the first time that I think that I have been in violent agreement with everything that you just said.

And this is a nice homecoming, I also want to thank the MITRE folks because after graduate school I actually started work here and then they shipped me away, I didn't fit in this building so they sent me to a Fort Monmouth and a young man named Al Grasso and I were group leaders there, I see he is on your board now, so Al has moved up.

I am going to talk about the...and the point is I learned my PowerPoint style here at MITRE so we are going to have some fun animations I'm going to go very quickly. So, ignore the man behind the curtain and watch the animations, but if you go into the way back machine to just before last year's ONC annual meeting there was a lot of confusion. There were competing profiles and standards and it was sort of an unhappy space.

We were trying to implement four different profiles and standards and here they are. But fortunately, toward the end of 2014 they were harmonized into the IHE HPD model profile standard whatever you want to call that. So, that made us very happy because we thought that you could then take that standard or profile and just shove it full of provider demographics and licensing and credentialing information and electronic addresses, ESI, and information from the NPPES and that you could do that and people would log into that and you would have happy users all around the directory. Well, that was not quite right. They were not happy logging in because that thing did not provide value. So, my magic lightbulb did not show up on time today, but I was going to have a magic lightbulb go off.

It was hard to keep all that data accurate. There was a very high cost to scrub all the data, in fact we started buying commercial data, don't do that it's a waste of money, okay, the commercial data is not so good. And now we had standard silos, okay, but more of them and lack of interoperability, no APIs, you are going to hear a lot about APIs in this talk. So that was a very unhappy situation, you are missing the animation if you are looking at me. So, that was expensive and it was just not good.

So, we had the lightbulb go off, eureka, that the provider directory is not an end valuable thing by itself, okay, you still need access to all of this type of information that I've described but we decided to wrap APIs, starting with REST, we implemented in our directory services and Salesforce that came with REST

but we recently wrote FHIR APIs to wrap around our directory, so it is really like and SDK now. It is a set of services it is not an end destination. It is a critical piece of central infrastructure and you are going to see how we are using it in Michigan, but it did not have all of the things from the IHE HPD standard.

So, Dr. Jeff Eastman working with people like Brian and Alan, I think is in the room, Grahame Grieve extended by adding more FHIR resources to add support for electronic services, memberships, taxonomies and we have published these FHIR APIs, there is a link in the slides they are publically available. They were used in a hack-a-thon this weekend so if Mark Scrimshire is here he can talk about that later.

So, this still did not result a happy end state for users because all you have now is just more infrastructure with no real value yet. But it is how you apply that infrastructure to solve important use cases that matter and if you read that ONC Strategic Implementation Guide that John Rancourt mentioned for the SIM states, it is an implementation guide for provider directories, it talks about the valuable use cases that provider directories need to support including care coordination, things like admission, discharge, transfers or medication reconciliation at discharge, quality measurement, who has heard about quality measures this year, yeah, okay, and then garden variety uses such as Help Desk and I'll talk about that in a moment.

In Michigan we receive, what I think Elaine maybe had a slide that showed patient panels, we call them patient provider attributions, directly from the providers every month and we have 7 million plus unique patient records where these are patient provider attributions that say "this provider has these patients" that's important for care coordination because when one of those 6 million plus ADTs comes into our network, per week, that's more than 98% of the admissions in the State of Michigan coming into our network, we look up that patient and we say "wow, this is a complex chronic condition patient" there are 12 providers on the active care team attributed to this patient.

And we clone a copy of that ADT for every provider on the care team and we look up every provider in the provider directory through APIs, okay, and we say, send a copy to Dr. Kibbe at his Direct address, send a copy to this EHR vendor to be consumed in their EHR and oh, this skilled nursing facility they want a copy and they use a workflow tool for ADTs called patient ping so that is their ESI, they want it to go directly into their ADT workflow tool. We have, in March, 28 million ADTs processed just like that, each of them resulting in provider directory lookups.

We have just started the implementation of a new medication reconciliation use case and we have five hospitals participating there and that is only about 50,000 messages a week but they are big messages.

And then we are starting with new Apps that will be on PDAs for providers and consumers and where they can manage the active care relationships. So, you could dispute a relationship that a provider asserted, okay, or you could add a provider that does not show up in your active care team. So, those are the care coordination use cases.

Quality measures, what can I say, we started in the 2013 Trailblazer's effort taking Category III QRDA's from providers with four simple API calls to a direct HISP from within the EHR. API call number one,

create an empty Direct secure message. API call number two, attach the QRDA file. API call number three, fill in an address, CQMs at direct.mihin.org. API call number four, press “send” it shoots the QRDA file to us automatically from within the EHR, zero provider workflow to send in CQMs. That will be required June 1st for Michigan EPs, EHs and CAHs to report to State Medicaid.

We also just became a registry for PQRS. We are working with all the payers to standardize on a format to produce the HEDIS. You know the other measure sets I won’t dwell there.

Lastly, garden variety things, since we use Salesforce Help Desk comes built in for years, for decades our state immunization information system, MCIR, used Excel for their Help Desk, oh, my gosh they used Excel. They are moving to our provider directory because it has all of the Salesforce capabilities for Help Desk built in.

We are working with New Jersey under their ONC grant; they are implementing our provider directory there as well. They are going to take all of that Salesforce data from their Regional Extension Center instance and integrate it with the HPD instance there. So, any registry within your state really could utilize those garden variety Help Desk use cases.

If you support these valuable use cases finally the desired end state from that ONC Strategic Implementation Guide, happy people, happy users all around. So, that’s how we get to the happy state plus the way that we get the data is directly from the providers and this means that we get accurate, current and affordable data.

We used to buy commercial data and it was thousands and thousands of dollars, this is free, it is directly from the providers, it is monthly, it is accurate, okay, usually, faster, better, cheaper you can pick any two, we have all three using the provider generated data.

So, I have some personal predictions and I think that, in my opinion, silo directories are not going to make the trip. I firmly believe that a national provider directory capability, notice I didn’t say directory, but a capability, using the kind of federation that Rim talked about, will emerge.

We have to have the standards. There is proposed legislation with Senator Alexander’s HELP legislation requiring an index that provides digital contact information for health professionals. This is not your fax number, this is not their street address, it is not the 20th Century brick and mortar yellow pages, white pages directory. It is a modern digital directory.

We are seeing the first movement in SIM states like Michigan, our SIM team is committed to the statewide provider directory and in PTN states like New Jersey because again they center around those use cases for quality measures and care coordination.

What we have described exist today, it is a certain distance from the North Pole in East Lansing, we have thousands of organizations in production, 56 receiving physician organizations that receive those coordination messages, almost 10,000 providers receiving these notifications in real-time, sometimes via

Direct, sometimes into their EHR, sometimes into a workflow tool, 60+ SNFs are in production. I mentioned some of the other numbers so I won't repeat that.

So, the providers are the best known source of the provider organization and affiliation, you heard talks about affiliations and memberships that data. And we are moving away from the monthly batches to FHIR APIs, we just published FHIR APIs.

Here is how we support quality. Here are four quality measures for three real providers in Detroit Medical Center Southfield Family Practice and you can see the rows are quality measures, the columns on the bottom are providers, each of the three providers on the bottom has room for improvement in one or more quality measures. The one that is the light green is childhood immunization status, so they are all green, but still room for improvement on childhood immunizations.

This is our network of networks in Michigan, we have more than 56 trusted data sharing organizations connected to our network mostly through virtual private networks but anyone can send using Direct. This is not altogether dissimilar at a high-level from what Oregon and Rhode Island showed you because on the right you have all of our state repositories and registries, our state licensing bureau, they don't feel like they need the NPI number so we are working with them on their modernization there. You have the major pharmacies, we have 10 HIEs in Michigan, so it is quite a complex network. We also connect to more than two dozen payers they get copies of ADTs and medication reconciliation as well. And we also connect to the Sequoia Project.

A few health systems connect directly to us like U of M and Henry Ford, but most of them connect through one of the HIEs, that is our network of networks model, and we are the single point of entry for public health reporting into the state. We have about 1.5 million public health messages that go into the State of Michigan through our networks each week.

This is a different way to draw it and you can see some sort of futuristic things in yellow, we do want real-time submit requests interaction with credentialing services, with DirectTrust.

We have done real-time exchanges with the NPPES 3.0, I don't know if Richard Gilbert or Alan Viars are here, but we started that more than a year ago with the late Hunt Blair and Alan Viars when they were doing the NPPES redux and just recently during a call with Richard Gilbert on the phone, E-Jeff, Dr. Jeff Eastman, did a RESTful get during the call to the NPPES 3.0, it's out there, it works, it's easy to integrate real-time with the NPPES 3.0. So, and thank you Alan and the folks at CMS for modernizing, but this is sort of the way we draw this and the relationship between our HPD, the quality measures and the active care relationships.

We started rolling out our APIs two weeks ago in Baltimore, we published that and it is available to you. Here are some of the goals. We also support a statewide consumer directory, I'm going to show you a quick diagram of that in just a moment, but the object models for the health provider directory and the statewide consumer directory intersect at those active care relationships, that is where you have the linkage between the provider, object model and the patient object model or patient resource in FHIR.

We did have to extend FHIR as we mentioned, here is a drawing of the provider directory and consumer directory populations and how the active care relationships form that intersection. We do keep all of this information in the same Salesforce instance. You can just think of the provider directory as containing a routing table, okay, for delivery and preferences for providers and then the consumer directory same thing, which PHR do I use, which patient portal do I use, where is my living will that sort of thing.

We have our HPD object model based on the profile that we extended and you have seen some of those wire diagrams. Now you are getting very sleepy. So, you can talk to E-Jeff about the FHIR slides that I am just going to blow through here, okay, but this is real, it works, they used in the hack-a-thon this weekend. So, if you want to try it out there is plenty of wiring diagrams.

Directory evolution, no longer a phone book. We do a directory service as sort of an index routing table, okay, where you look up, as Rim was talking about, and discover where to send things in a trusted batch but you need to include all caregivers not just licensed physicians, you need care coordinators, community resources, success coaches not just people with an NPI number.

We talked about the attributions quite a bit but you need health plans participating and population health such as Accountable Care Organizations. Finally, we talked about the need to represent patients and consumers as well. The SCD is a topic for another talk.

Now, I wanted to evolve from this drawing, how we draw ourselves in Michigan, to this concept for a national virtual provider directory. So, you have all these custom Apps at the top layered upon some services including the NPPES 3.0 with a layer of open APIs surrounding that and then the sources at the edge of provider data and that data can live where it lives, it can stay where it stays. You can get it in real-time when you need it just as Rim described.

So, we think that this is possible. We think that collective action is required with federal and states and private sector participation. We think that there should be a national coordinating working group, Karen the NDOG, I think would be that group or maybe not.

And so you have to establish the governance but why don't we do that? Why don't we nominate some co-chairs this week, here, now and I nominate John Rancourt as the federal co-chair, and so we could identify key stakeholders and get moving on some of these required things. Here is the link to our APIs and of course we need additional funding for all of the CMS folks in the room.

But keep in mind there are different directories for different goals. As we move forward from today it is very important to realize that organizations like CMS with the NPPES and the PECOS are managing NPI numbers for the Medicaid and Medicare provider populations they have other things that they are doing but that is a primary purpose.

DirectTrust they are the master source of truth for Direct addresses. They also have other goals and purposes but that is a main goal that differentiates them. Ron, I see is here from CAQH and you guys are

supporting payers such as with provider demographics who in rural situations and so forth where the data is hard to obtain, so you have your unique purpose.

I could not list all the states, should have Oregon and Rhode Island here too, but States like Michigan, New Jersey, Oregon, Rhode Island we have our purposes, okay, and they are very different from these other organizations. We are trying to support use cases in our states and it is very different from what CMS, DirectTrust and CAQH are doing with their directories.

And then there are a lot of you who are affiliated with other directories in the room, there is the FHA pilot, there is Sequoia, there are lots of commercial directories each has their own purpose. So, how could we bring this together? How could we work together toward a common goal and in discussions with John Rancourt, John, thank you for this concept, these organizations we could all sort of work together and center around alternative payment models, that is something we all have in common, okay.

Clapping

I knew I'd get at least one, thank you, John. And so I just want to go back to the next slide and leave it there for questions. Thank you and you can send complaints to the editor...thank you.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Great, in the interest of taking a break, I hate to cheat you out of questions, but for questions if you could please put them on stickies' we'll get them posted afterwards, see Rim over here. Be sure to put something in the corner that indicates which state that particular question should go to if it is a state specific question. WiFi password is on the poster there. There are power stations around the outside should your electronics be running out of juice.

There will be a parking lot for issues where we don't continue on conversations because we are off track and we need to continue, it will either be covered later today, tomorrow or after the meeting.

If you leave the building, please turn in your badge you will get it back but you cannot take your badge outside of the building.

There will be a snack trip going upstairs to the cafeteria, they are going to bring about 15 or 20 people up, again, you need to travel in groups, and again, a reminder no escort required does not deputize you to be an escort of other people.

So, 20 minute break and thank you all the speakers and thank you for your questions and participation. And a 20 minute break for folks on the phone.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

I would to give people a little bit of a preview for some things coming up. Jeff broached a really important topic in his talk, he started talking about use cases and that is part of what we are going to be talking about a little bit this afternoon and especially tomorrow so I would like people to start thinking about that. Start thinking about what use cases we need to deal with and what things we need to do moving forward. Dan do you have a couple of remarks you need to make?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

No, let's move right along.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, so we'll get started. We are going to shift a little bit, we heard this morning from some states and what they are doing, we are going to take a little bit of a shift in the next couple of talks and our next speaker is going to be Sarah Summer. Sarah Summer comes to us from Blue Shield of California where she is the Deputy Director of Public Policy. Sarah?

Sarah Summer, JD, MPH – Deputy Director, Public Policy – Blue Shield of California

Hi, so I flew in this morning so if I don't make any sense just raise your hand because I might be a little bit delusional. Like Jeff, this is kind of like coming home for me except not MITRE I was at CMS before this so my slide skills are from there. So, if they are not that impressive I don't have the graphics, I'm a little bit sad to go right after you because I had one slide I was really proud of and now it looks kind of silly, but, you guys will all applaud anyway.

So, I wanted to talk to you guys a little bit, moving away from kind of the technical side to kind of post ACA, provider directories and one of the things that I do think is important that Rim mentioned right in the beginning is definitions.

So, I think we have talked...the three things I have heard today that are common themes from the first presenters are really about standards, about simplification and about centralization, and so we are kind of working on something that is related to all three, but just to kind of lay the foundation of where we are, we are talking about provider directories from the consumer-facing side, so that is where we are focusing our efforts right now and a lot of that is because of kind of the result of the ACA.

So, post ACA, we are out in California where the ACA is really...there have been a ton of enrollment, so we have had about 1.5 million people through Covered California, our state exchange, we have about 4 million new enrollees in Medi-Cal through the Medi-Cal expansion. Most of these people have never had insurance before so it is kind of a whole new world for them.

And we are also working on kind of transitioning as a payer we are transitioning from an employer-based coverage to also marketing to individuals as consumers, which is new and different in a lot of different ways. And not only individuals but a totally different socioeconomic class, different health mix, different demographic mix.

So, this is a chart from the Kaiser Family Foundation, this is the pre-ACA uninsured in California, Leeann from AHIP pointed out that if you do the math, so don't do the math, but the pie charts, the percentages don't really add up, but what you will notice...yeah, I mean, family income is not even close, family work status is at 101%, but what you will notice is the newly insured are largely subsidized so 88% of our Covered California insured receive APTCs or tax credits, 50% of those received cost sharing reduction, so they are definitely lower income. So, their average cost of premium is reduced by 70%.

The newly insured prefer help enrolling. So the majority of people are coming in with some kind of assister so it is either a consumer assister or an agent, a broker, customer service representative. So, what that really means is that they need a lot of handholding walking through this process, mostly Asian, Latino and White in California that is representative of our demographics.

And then the other big thing, for us, and what is really relevant for provider directories is that this population churns at a much higher rate. So, they are mainly leaving and that's this little chart over here on the right, but they are mainly leaving for employer sponsored coverage, which is great, but they are also churning down to Medi-Cal.

And then they are coming in and out, which is important because that means that we have to keep our provider directories or consumer-facing provider directories accurate so that they can choose a plan based on their providers.

So, the challenges of the ACA, the big challenges for us are keeping costs reasonable, so both the cost of healthcare but also the cost of premiums to the consumers. And what that means is you are seeing a lot more of these high value networks so network design is a good tool for that, delivery system reform, improving quality and then the second big challenge is really explaining a complex product to newly insured so that is out of pocket costs and then benefit design.

The out of pocket costs is really relevant to kind of the provider tools that we talked about around the cost calculators, so those are actually really important as well.

We talked about higher rates of churn, so continuity of care and providers are a huge factor around decision choices.

And then the one that is challenging for us is the new government oversight and regulations. So, in particular around provider directories because of these kind of new network designs we are seeing a ton of regulation both on the federal side with CMS and then on the state side in California we actually have two regulators, the California Department of Insurance, we have the Department of Managed Healthcare and then we have Covered California which is technically not a regulator but through contract is actually regulating in a lot of different ways.

So, these regulations are really challenging, they are complicated, they are conflicting and they are confusing and then there are also the operational challenges of implementing them.

So, when I came from CMS I thought that once you move from government to the private sector everything would be super easy and that you could build a system and it would be pretty flawless, that is not correct, writing code is writing code and that takes a long time, and making these things work is really hard. So, I think trying to figure out what the requirements are, building the business requirements and then actually operationalizing these has been really, really challenging for the industry.

So, what does that mean for provider directories? So, as I talked about consumers are really relying on provider directories now to kind of review their networks and choose a plan. The new network designs, so AKA these are all just the same names for the type of narrow networks that are really helpful in kind of managing costs but are also confusing to consumers and really put an emphasis on the provider directories. So, it is using a limited network size as a tool to kind of manage cost and improve quality.

And then the long-standing challenges around the accuracy of provider data are magnified, this is not a new problem. So, people have been trying to fix the provider directory problem for years and years, and years, they have put billions of dollars into this, it has been really, really hard to solve, it has not been as much of an issue because people are in these broader networks, especially the broader employer-based PPO networks so it has not been as much of a problem. It is now kind of a problem that is kind of highlighting the issues and those are the issues around provider confusion so there are a bunch more networks, they have all new network names. Providers don't really know which network they are in, that is a challenge for us as a plan but also a challenge I think for providers to learn that, quickly changing data.

So, the big thing that we are hearing a lot of pushback on, the two questions consumers have are, are you in my network and are you accepting new patients? The later changes a lot. So, that is no longer an every two years, every credentialing cycle issue, it is now kind of a challenge that we have to deal with on a weekly or monthly basis and that also puts an onus on providers to kind of update that information with us as well.

And then the other big challenge, outdated systems and processes. So, we have been using fax as our primary mechanism to update provider information. Providers have been using faxes that are common with health plans. It does not really work in this day and age and it is changing, but that is kind of the system of choice right now.

And then for us there is a lot of reliance again on factors that are outside of our control so that factor of the providers, we need them to tell us when they are not accepting new patients and then we need to update that, and that is kind of outside of our control.

The other big points are if you move, if you change your phone number, if you change your hours, you are in multiple clinics, if you change those clinics on different days. So, we do update those and get new information but we need it to be quicker. So, we need the cycle to move faster.

Then I talked about the regulations. Federal side, CMS has the Qualified Health Plan Regulations so they have regulations for the federal exchanges and then also some kind of lesser regulations for the state-based exchanges, the Medicare Advantage Rule, so the call letter that came out last year and then the Medicaid Mega-Reg which is coming any day now, which has its own provider directory requirements.

On the state side, in California, we have SB 137 pass last year that was huge, there are a lot of data elements that now plans have to keep up-to-date, the other big thing, which I am going to talk about in a second is it creates a shared responsibility for providers. So we have an obligation to do affirmative outreach to providers every six months to a year and they have to respond and if they do not respond we have to remove them from our directory. That is a problem for us in terms of network adequacy and that is a problem for them in terms of responding to all of these plans with all of their information.

One of our regulators, CDI Release Network Adequacy Regulations, DHCS is our Medi-Cal and Medicare regulator they have their own requirements that are separate and unique.

And then in terms of state oversight, in California very active regulators so DMHS our Department of Managed Healthcare who oversees most of the Covered California plans, they have done a lot of kind of these non-routine surveys to check the provider directories and we have realized kind of we need new metrics to determine what is accurate and when. So, calling a provider to say “are in you network” is really challenging if their office staff does not necessarily know. So, I don’t know how much time I have so I will move faster.

So, my three big things, provider directory has really three main components so it has the provider portals so that could be anything but for me that’s how a provider is updating their information, so it could be a website, it could be e-mail, fax, phone call.

And then the big one, the provider database, so where the data is stored, cleansed and validated. And then the last one, which is equally as important to consumers but it really is kind of the last piece of the puzzle is the consumer portal. So, this is how the consumer sees the information and this seems to be what everyone wants to fix first because they want the consumer to get the information they need, but what really has to happen first is that this provider data has to be accurate.

So, we have seen a lot...and we had challenges with Covered California and I know some of the state exchanges have had these problems too where they are trying to put out a multi-plan provider directory but if you do not have the foundational data accurate you are just putting bad data out to display to consumers.

So, this was the graphic I was really excited about but, so we have how it works now, a provider gives their information they update it with each individual plan and then the consumer on the right gets the information and then when they call the provider, the provider gives them something different and that is for a total variety of reasons and my graphics over hear is the fax, this is mail and this the pony express because that’s how long things take. Someone actually told me we could try Morse Code, we could try all of those but it is not really working, it is totally broken.

So, our opportunities, so how do we fix it is the big question. So, there are a few things that we are trying to do, one a provider shared responsibility so this is a partnership, it is both the plans and the providers.

So there is the carrot so you want to make it easier for providers that is the simplification part. So, we want to make sure that they can update their information in a single place and multi-plan is the best way to go and then better tools. So faxes work for some people but it doesn't work for everyone and it actually doesn't work for most. So, creating an online interface that is workable and usable, creating a phone or e-mail, or something that is easy is what we are trying to do.

And then the stick, so we have to have consequences if they cannot update their information. So, one of the sticks is contract requirements, you make them do it, but we have the network adequacy piece to kind of...they know that they need to be in the network.

The other stick in California, which kind of aligns incentives for the first time in California, is SB 137. So, not only do we have to remove them from our directories if they do not respond but we can withhold payment for up to a month and that is big. It is big especially for capitated groups because that is a month of capitation.

The second big thing to do is leverage efficiencies, so use existing data sources first. So, there is a lot of existing data out there. We talked a little bit about how some of it is really good for some pieces, I think the last slide there were six different buckets where CMS has the NPIs and then CAHQ has a different set of information and if we could leverage the different pieces that we know are kind of the truth and then use that first, and then cleanse and validate the data against that in a single source we can identify inconsistencies and then prioritize those inconsistencies and actually communicate to providers and get updated accurate information.

So, the idea is to create a master database, a centralized master database or this single source of truth. So, how are we doing it?

We have been working with AHIP. AHIP is doing a provider directory initiative. So, they are doing a pilot program. The idea was CMS came out with their new regulations for QHPs around provider directories and AHIP said, and all the plans said "well, you know we need the providers help too." And CMS came back and said "well, this is an industry problem let's think of a solution."

So, the solution, we really think, is to kind of create this single source of truth. So, the main principles are to improve the accuracy of the provider directories, reduce the noise, so take out all the bad information and then test different approaches and different markets to see what could be a path for a national solution.

So, AHIP evaluated three different approaches, so one is kind of the consumer search tool. So, how do we do it so it is more easy? How do we simplify the experience for consumers? That does not really work, again, because bad data in, bad data out.

The other one that was out was this provider data federation. So, kind of a virtual provider data network using search engines and third-party pool data for plan use. That is a good idea but we think the real solution is really going to be around the shared central provider data. So, some kind of database that is managed by a third-party vendor, validates the data so as many plans as possible, we want ideally all the plans to buy into the solution, but everybody contributes their network data, that data is cleansed against the other plan's data and is cleansed against the publically available data sources that we talked about, and then the inconsistencies are identified and then confirmed and validated, and then that information would flow back to the plans so that they can display it on their consumer portals.

So, we evaluated multiple vendors, we went with the pilot approach so it was a six month approach and then we are collaborating with providers and consumer groups. And in California...so there are two vendors, so Availity in Florida and Availity does it based on claims data. So, they do a lot of the eligibility and claims processing already so they kind of take all the plans and provider data and then validate it against the claims that come in.

And then BetterDoctor in California and Indiana. And So Andrew is here from BetterDoctor, we are working very closely with BetterDoctor on this approach in both California, we are not in Indiana, but they are working in Indiana as well.

So, the approach with BetterDoctor, this is the time I will come back to that, but the approach with BetterDoctor we talked about is really, and this is where it gets a little bit technical, so he can add any information, pipe up if you want to.

But BetterDoctor takes the information, so the provider data from health plans, from medical groups and then from other publically available and purchased data change signals, that is what they call them, so they are profiles, so any of the work that they have already done, publically available data, plan data, Yelp, etcetera, they take that, they kind of ingest it with an API, which I know is a buzz word and I learned what it means recently, and then they run their quality engine which identifies the problem, so anything...even if it is something as simple as John Doe versus Jay Doe, versus John, I don't know, John Michael Doe, they can identify that and kind of come together and create standards.

So, then they validate it. It is a validated record. So, we have to, in California, do that biannual or annual outreach so they do that every six months but in the interim on a monthly basis they are validating the individual provider records that have inconsistencies. So, it is kind of like an ongoing process. And then the export the data back out to all of the inputting sources. So, anything that is flawed will come back and will be updated in our directory and it will be updated faster or the one that we are seeing the challenges again is networks.

So, if they go out to a provider and the provider says "no, I'm not in Blue Shield network." They will come back to us and we'll say "no, we have the contract" and then we can do additional outreach with that provider so that we do not have these issues with consumers calling and not knowing if they are in network.

So, the timeline on that...so the pilot officially launched in April. It actually has been kind of going on informally for the last month, we have been talking with BetterDoctor and working with BetterDoctor and working with BetterDoctor for the last probably four months. We are going to evaluate the pilot by an independent third-party, so we being AHIP, in September and then there will be a vendor chosen and then hopefully there will be a national solution.

So, I think the big things that we are working on right now and why I think this conference, this workshop is so fantastic, is that it is really important that we have kind of stakeholder buy-in and stakeholders outreach.

So, ideally we would want a single national solution that would work for all plans and work for all consumers. If we cannot get that, which is okay, we know that nothing is going to work for everyone, we really want to stress that everything works together.

So, if we can't collaborate we want to coordinate and we want to make sure that everything is interoperable. So, for example in California we have a lot of provider groups. For the provider portal the provider interface they want to test out different solutions, so different provider groups might need a much more handholding intensive account management function. That is fine if they want to do that and update their data themselves as long as that data can flow into the kind of this BetterDoctor master database set.

And then the other important piece is kind of the auditing. So, for every record BetterDoctor keeps kind of a metadata file so that it has which outreach occurred, what was the mechanism, what was the answer, who talked to who when so that we know what is happening with each dataset so we can actually kind of do the analysis and make sure that it is accurate. So, I think that is it. Oh, I got a red, perfect timing. Any questions?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

I think we are going to have to move on just to keep us on time.

Sarah Summer, JD, MPH – Deputy Director, Public Policy – Blue Shield of California

Okay.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

If you have questions, and I saw two...I really do want to make sure that we get a chance to come back for questions that did not get answered in the room itself. We are going to go ahead and move on now. Our next speaker is Atul Pathiyal is that close? All right, Managing Director from CAQH.

Atul Pathiyal, MPH – Managing Director – Council for Affordable Quality Healthcare

Okay, thank you again, I'm Atul Pathiyal from CAQH, I'm the Managing Director of the Solutions part of the organization where a number of our initiatives reside and thank you for having us share with you what we are doing.

So, just real quickly what I am going to talk about here is maybe a little broader than directory, really provider data and our perspective on the data challenges that the industry faces. I think many of you might know we have been focused on provider data for the better part of 15 years now starting with some capability around streamlining the credentialing application process between providers and payers and more recently expanding into a broader set of use cases.

Just to start though CAQH, again, for those of you who don't know, we are a not-for-profit organization. We are focused on addressing what we believe to be systemic problems that exist across the industry that plague providers, health plans, government agencies and other stakeholders across the ecosystem that prevent us from delivering the type of service and care that our country needs.

We are initiative focused so we try to target specific business problems and then construct specific solutions that address those challenges in a way that is commensurate with the problem we are trying to address.

We have a variety of initiatives, maybe just to paint a little bit of a picture here, one of our initiatives, CORE, is focused on authoring operating rules for the country specifically around the exchange of HIPPA-like transactions and other types of information across payers and other healthcare entities. That construct essentially is a group of 150+ payers, providers, vendors, government agencies, etcetera that sit down and write operating rules in a very formal way, these operating rules in fact are spelled out now in the ACA through Section 1104. So, that is one model that we use.

A separate model is to build what we believe to be shared industry utilities and we are going to talk about ProView as the anchor of that but that has now created a number of other opportunities that have, I guess blossomed here, trying to address specific segments of the provider data problem, again, with this national industry-wide focus.

So, I won't belabor this slide here, I think a number of the other speakers have already addressed at least comparable versions. I think the overarching sentiment is as an industry I think we need to develop a consensus point-of-view on what is provider data. We have a working definition that we have been using for the last several years here and it spans both professional providers, people, as well as institutions, those institutions have different locations, so location and institution or facility, or group are not necessarily the same thing. And then even those providers have different relationships and the relationships are an important aspect of understanding what that provider is, who that provider is.

An important point I think one of the earlier speakers mentioned is a provider may not really be a provider, especially as we look at long-term support services and other types of participants in the care delivery process. We need to think broader than just people with medical licenses.

But as the definition of provider data expands conversely we have also recognized the need to focus on specific segments of the provider data construct where the most value can be created in the shortest amount of time. And this is very much a preliminary construct for us here but what we have tried to do is define essentially different tiers of data so that we can prioritize our efforts around acquiring this information, making sure that it is accurate and making it available to the industry at need.

Important in this tiering here is understanding when the most pain is created across the industry, when the problem arises, because of that we can then identify a solution that creates value and that value can then be parlayed into a sustainable operating model that allows us to get a solid step forward and then move onto the next part of the problem. I'm going to keep moving on here in the interest of time.

So, to set the stage for how we look at the problem, we've constructed very high-level value chain for how we think provider data is acquired and managed within a typical relationship between, in this case here, a provider and maybe a health plan or a hospital and so on.

And the four steps, as we look at it, is engaging that provider or source of information to acquire some set of information, okay, then running a variety of validations, analytics, comparing it to other sources, etcetera to determine and develop some sort of point-of-view on that information. Then managing that information and providing it to an end recipient, an end-user, presenting it in a way that is meaningful and contextually relevant to that end-user, so in the context of a health plan making sure that the information about a provider pertains to the contracted relationships that a payer might have with that provider and not necessarily parts of the provider that are irrelevant to that payer.

And then lastly, using that information, and this typically will reside within the four walls of a recipient entity whether it be a hospital or health plan, etcetera, but how do you take that information and then use it if you are a health plan in your provider directory. If you are a hospital and your master provider book of record and so on.

How that information is managed throughout the enterprise is an equally complex challenge not only getting that data to the front door but getting it throughout the different departments and silo'd systems within a health plan that could be a very large multi-line of business, national organization but it also could even be complicated within a hospital or potentially even a multi-specialty provider group that has different locations, different clinicians working throughout that organization.

Throughout all of this, and this was another topic that was raised earlier and we would echo, there is a need for a strong understanding of what data is important and how do we assess quality. And as we got deeper into this exercise over the last several years recognizing that even our definitions of data, and the best example that has come up recently for us, how we define data is critical, specialty, as I think many of you know should be a seemingly easy concept to define except what we found is providers tend to believe that they have certain specialties those could be board certified so a board might actually be the source of correct specialty information.

Of course the payer that is contracting with that provider might want to contract under a different specialty and have negotiated something with that provider, so within that payer's world they view that provider with a different specialty.

And then there is this credentialing process that happens somewhere in there as well where the provider might be credentialed according to a certain specialty, although that tends to align with the board.

Those different perceptions of the same, I guess, data piece of information about this provider, as an industry we need to sort out what do we mean when we talk about specialty and how is that information used in these various contexts when a consumer is looking to engage that provider which of those definitions is most applicable when we think about how that care is going to be delivered, how that care is going to be paid for and so on.

So, as I mentioned earlier, it is critical for us and largely because we are a voluntary organization our initiatives are voluntarily adopted by the industry, it is critical for us to make sure we understand where the problems are. If we cannot solve the problem we are not able to deliver a service that will be willingly adopted by the industry.

In this case here, I know it is an iChart, but just bear with me for a second, what we have done is mapped out where all the different friction points are between a payer and a provider as that provider engages with the payer and the payer manages that provider's information through their internal, I guess, departments and functional areas. And what these different call outs speak to are specific areas where effort is expended to collect information and then more importantly, where the wheels go off the rails, if data is bad and that causes increases in labor, it causes increases in cost, those costs could be both labor and technology, it causes delays in critical processes. All of these create tangible challenges for payers, providers and their ultimate end-user, the consumer, the patient that is relying on both of them. Those challenges are what we are trying to address.

Now that was current state recognizing the world is changing. The problem, in our mind, is actually becoming more acute. As we move towards a value-based care model across the industry here many of these challenges that previously made a lot of, I guess, were very apparent in fee-for-service actually become more profound because more information needs to be shared and if we cannot share that information reliably and then importantly when there is a data error that the inability for the entire system to function as well as it needs to creates profound implications for all of us.

So, one of the things that we have been doing over the past two years or so is working with numerous stakeholders payers, providers, in this particular case the capability vendors that are helping those two stakeholders deliver their various offerings make sure that we understand where the market is going so we can not only address challenges today but address or build towards a solution that addresses challenges for tomorrow.

And then on top of the changing economics of the problem, of the care delivery world, we also have regulatory complexities and Sarah I think addressed some of this in her talk before me. An important point that I would like to raise here is I think you can look at the increasing regulation addressing the

quality of provider data specifically within health plans in this context here in one of two ways, one is the regulations are creating more challenges for providers and payers and we need to find a way to address that.

The other lens here is, I would argue, that these regulations are an attempt to solve a fundamental problem that as an industry we have not been able to solve today and so in that vein these are creating an imperative, a further imperative beyond the economics to address the provider data problem in a sustainable way.

I am going to jump ahead here to just give you a sense of how we are looking at the problem. So, our premise is now, as an industry, how do we move the ball forward? What we have been doing now for 14 years is trying to streamline how information is collected from the provider and how the provider is engaged in the maintenance of that information.

We have been working with now more than 800 different health plan, primarily, but we have more than 100 hospitals, provider groups, large IPAs and so on working together to ask information of the provider, and as somebody said earlier, we do believe that the provider is a critical source of this information, if we can engage that provider efficiently and effectively we will be able to improve the quality of data that we have for all our various business needs.

The solution that we have undertaken here, and again, 13-14 years ago now, it is called CAQH ProView, it is a multi-payer portal that a provider, now 1.3 million providers, can go in at no cost and put a set of information that mirrors what I described earlier and manage that information over time. They are asked to re-attest every four months, 120 days, to make sure that information is correct and importantly those 800+ healthcare organizations that I described on the prior slide all ask those providers to do the same thing and because they do that these 1.3 million providers growing at a rate of 7000 providers a month come in to the CAQH application and maintain their information.

We have engaged the provider community extensively over the years, have strong support from MGMA, AMA and others, and continue to look for their guidance on how we should move forward. And just at a high-level I do want to point out a couple of things in terms of where we are going.

So, at a cartoon level here is how the system works. Starting on the left-hand side here, and if you can overlay the mental image you have of our provider data value chain here, in terms of acquiring information, engaging the provider, again, 1.3 million providers, across the country, all provider types, so any type of professional provider at this point we expect to expand to non-professional providers, institutional providers in the upcoming years here.

These providers put data into our portal, manage that information, in the middle here we are doing a number of things now that move beyond self-reported information, we are validating information against some publically available sources like NPPES and so on, DEA numbers, etcetera. That will continue to expand as our capabilities improve.

We are also, and I'll talk about this in just a second here, we are also now contacting providers to confirm their directory information, directory in the health plan context, primarily because of that regulatory imperative that was created over the last year or two.

And then that information is made available, again, from an information management perspective, we want to make sure that we can make this data available to our end-users in a variety of forms that are relevant to them. We started with a portal-based lookup and flat files 14 years ago, introduced some more robust capabilities. We have web services now, a RESTful service, that is available and we will continue to expand that over time. The key for us is building data outputs that support our end-users.

And then important in all of this is our end-users, these health plans, the hospitals, etcetera are becoming more sophisticated in how they are consuming this information. And so not only do we need to design for what their capabilities are today as they make significant investments in their claim systems, their electronic health records, etcetera that we are able to meet their emerging needs in the future.

We have acquired I think a significant amount of perspective here on the different, I guess, models employed by these end-users and have been looking to get deeper into understanding where these end-users want to go so we can build for the future.

So, if ProView is our platform three things that sit on top of it, one is something that we launched early this year called DirectAssure this is our directory validation effort. We have begun outreaching to 600,000 providers across the country to get them to confirm their directory information that started at the beginning of the year. So, we are live now nationally and for all provider types.

We also, several years ago, augmented the self-reported information with disciplinary action information from state and federal sources. So, we now canvas some 540 different state and federal sources for license revocations, debarments, etcetera and it is important especially as we think about more and more care being government subsidized looking at this as program integrity compliance as an important aspect of maintaining provider information.

And then lastly, as we started, at the beginning of this exercise we were focused on provider data as it related to credentialing applications. Later this year we are going to get deeper into the credentialing process and actually deliver a credentialing verification organization. So, we will be able to credential providers and so that will go live at the end of this year.

We are continuing to expand the offering as we get a better understanding of where there are pain points across the industry. Again, we think working collectively, especially as it relates to provider friction and making sure that we are not burdening the provider with a lot of unnecessary or poorly coordinated activities, getting them to engage in a streamline and effective way is critical to move the ball forward for the industry. I know I am over time, sorry.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, well, thank you. Unfortunately we do need to move on to try to keep us on track this morning. If you have questions I have one pad here and there is a blue one that is floating around the room someplace, so I will make sure that those get out. Our next speaker is going to be David Kibbe who is the President and CEO of DirectTrust. David?

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Good morning everybody, it is a real pleasure to be here. There are quite a few DirectTrust members in the crowd so I am glad to see you here today and those of you who are also supporters of DirectTrust welcome.

As I start my talk and think about what we have heard so far today a couple of things, introductory comments I think might be useful, one is that I think it is important to understand what problem we are trying to solve when we talk about a directory effort of a particular kind and I think that with respect to DirectTrust and its members the problem we are trying to solve here is pretty discrete, it is pretty well-definable and we are accomplishing solving this problem pretty well, and that is that people who are using Direct exchange often do not know the Direct address of somebody who is a clinical trading partner.

They are trying to push information either because they are discharging a patient from a hospital and moving that patient into a long-term care facility or to a provider organization, or they are looking for ways in which the information that has been requested of them can be sent to a party who is outside their organization and I think that is a very important distinction to make here is that in most cases when Direct exchange is being utilized today it is being utilized to move data from one organization and one security domain to another security domain.

So, I get calls all time from care coordination specialists in a hospital system and they are saying “how is your directory project going along because we, EHR A, and we’ve got to get information to somebody using EHR B and it is very hard for us to get that information.” So, that is the problem that we are trying to solve. It is potentially useful to think about this as supporting other technologies beside Direct exchange obviously but right now we have been very much focused on Direct exchange.

The other introductory comment I would like to make is that every one of the programs that I have heard so far this morning and those that I am sure I we will hear later this afternoon and tomorrow are evidence that interoperable health information exchange in this country is really starting to take off and I think the glass is very much half full, not half empty, we would not have this problem if we did not see health information exchange being a desirable new component to our health information technology systems and to the work of doing medical care.

So, a word about DirectTrust and Direct exchange, a couple of things that are probably unique about our effort, and notice we call it a directory aggregation service not a provider directory but a directory aggregation service, are that one all of the addresses that we are talking about, all of the entities that the people and organizations have been identity proofed at what is equivalent of NIST LoA 3. So, this is a large system of participants in Direct exchange who have all been ID proofed.

Secondly, this is a national directory effort. We have about 350,000 addresses or accounts in this directory effort to date and they represent all 50 states. So, whereas we interact with health information exchanges and we certainly understand the importance of state efforts and regional efforts this is very much a national effort.

For those of you who do not know much about Direct exchange or DirectTrust let me just briefly say that DirectTrust itself does not handle any data. We are an entity that supports the work of Direct exchange by 40 HISPs who in turn are contracted with over 300 electronic health record vendor's products who are certified by ONC to be able to do Direct exchange. There are also about 50 HIEs, Health Information Exchanges, that are participants in this network. They in turn serve somewhere in excess of 52,000 healthcare provider organizations of one kind or another and there are a number of federal agencies now that are implementing Direct and will be part of this network or are coming on board. And in total there are about 1.1 million Direct addresses or accounts within this network.

We do not know exactly the number of transactions that have been sent or exchanged over the past year. We are never going to have that data as discrete as we would like but in 2015 it was something like 45 million transactions just within this network of networks and we expect there to be over 200 million Direct exchange transactions in 2016.

Part of the reason for that is that Direct exchange is being used more and more for transitions of care associated with Meaningful Use, but we are also seeing the growth in the numbers of use cases for direct exchange outside of the transitions of care and Meaningful Use framework.

So, for example, for release of information and for administrative exchange of information or for reporting on quality measures as Jeff was talking about where the health information exchanges and their entities are using Direct as a low cost but very highly secure and identity assured means of moving data from one point to another.

Essentially, what is happening in this country is that Direct exchange is replacing fax and eFax over time along with some use of couriers and mail, that is not a very exciting thing but I think that use case is probably going to persist for quite some time.

So, the role of DirectTrust here is really more like Visa than it is like a centralized hub of health information exchange like for example Surescripts. DirectTrust does not move any data, we do not touch any PHI but we provide the security and trust framework that supports this network of networks and allows trust to be established between the parties who are exchanging this information without them having to negotiate with one another.

Imagine if you took your bank card to a merchant and every time the merchant needed to know whether or not they could trust your last Bank of Omaha credit card they had to call the last Bank of Omaha and see whether or not there was a contract in place. Visa of course and Master Card are examples of federated trust communities and that is the kind of role that DirectTrust plays.

So, it was fairly early on that our member HISPs encounter requests from their customers who were electronic health record vendors, and the personal health record vendors as well, who encountered requests from their customers and communities all around the country who were medical provider organizations, hospitals, medical practices about “how can we get all of the Hospital B’s Direct addresses into our own EHR directory or our personal health record directory so that we don’t have to have a pizza party in Community A and go around and exchange Excel spreadsheets?” I mean, this is really the problem that we are trying to solve and it is being solved.

So, we decided that we would then create a methodology, a directory aggregation system that would allow those HISPs, each of which has its own directory, to submit to our directory aggregation service and allow them to pull that data back out so that they could then inform their EHR vendors and personal health record vendors, and health information exchanges whoever their customers are and then they would enable their customers to be able to look and find this data more easily.

We really decided to take a crawl before you walk, before you run perspective for a lot of different reasons and I will talk about some of those. The two main ones being, as every participant in this room knows today, maybe somebody is going to develop the Uber directory that we all want and need and I’m not sure that is going to happen there are a lot of different constituencies that need information for different purposes and different slices and dices.

But perhaps the federal government is going to suddenly make all the directory information of NPPES include a Direct address in which case our effort might not be nearly as valuable as it would be and somebody else would take on the cost and responsibility for doing this because, as you all know, it can be quite costly and very complicated to maintain any sort of directory.

We also started off with a data sharing policy approach, that is if these parties are going to be contributing their information to our central data aggregation effort what guarantees do they need and what guarantees do their customers need with respect to how that data will be shared or prohibited from being shared?

And I want to raise a point that you have heard a little bit this morning with the folks from CareAccord is that even though these data, we all know, are ultimately publically available the electronic health record company or the hospital that contracts with the electronic health record company may feel that it is proprietary because it is their customers and they have gathered that information.

Our aggregation only has 13 or 14 data points so it is a very small dataset but at the same time it is difficult to get people to contribute this if they feel for example this may lead to spamming or this may lead to unrequested informational requests from parties that they do not know.

Very quickly, we have about 345,000 ID proofed Direct addresses in our directory now, we expect 400,000 by the end of June and we are ending our pilot so we are coming into production mode, so a number of HISPs who did not participate in our pilot program will be participating in the next round. We could have as many as 750,000 or 1 million addresses by the end of the year.

This is a simple white pages data model. Each HISP is responsible for the curating of the provider data it contributes we do not do any of that. So, far this has worked out really well because it is in the interest of the HISPs and their customers to keep that information accurate and up-to-date. If they are supplying information that is not up-to-date or not accurate then their trading partners start to be uncomfortable.

Very quickly, some lessons learned, I wish I had bolded this first point, simple is important and it works. I think that technology is really cool and I love getting my feet wet and down in the weeds and talking about all the new things but when you have a small budget or you are really trying to do something with a large group of parties that are collaborating with one another it needs to be simple. If it gets more complicated because it is successful that's fine, but initially we have kept this very simple.

I have mentioned that the parties in the collaboration, which is DirectTrust, we have about 150 members now, 40 HISPs, etcetera, many of our members now are healthcare provider organizations, are very sensitive about this data and therefore we have to be careful that our data sharing agreement includes the appropriate prohibitions against the resale of the information for example which is one of the things that people are very worried about.

Slowly but surely the HISPs are going back to their EHR vendor customers for whom they are often business associates or to their provider organizations for whom they are business associates and re-negotiating those contracts to allow them to submit this data to our aggregation service.

The federal agencies are...I am not going to have a chance to talk with you about it, but a number of federal agencies you may know have agreed to use the DirectTrust secure and trust framework and our trust anchor bundles, 23 agencies in total, over the next period of time as they implement Direct exchange. So, they bring in a whole new set of issues around directory and directory sharing on a national basis.

No one wants to pay for directory services or almost nobody wants to pay. I mean, folks may say "well, geez, you know, this is really valuable to us and to our customers" and then when we survey them and we ask them "would you pay \$100.00 a month, \$200.00 a month, \$500.00 a month" it is on the low side, I'll just share that with you, companies feel that it is not that valuable.

I think there is a very strong possibility that as some of the directory service projects and endeavors that we are seeing today and tomorrow mature there are going to be increases in requests for additional information.

So, for example, you may want to know when a Direct message is sent to you more about that party and for example what they are able to exchange than simply the inbound message and the inbound attachment. You may want to know whether this inbound message is coming from a patient and consumer, from a business associate of a provider, provider organization or a device. So, there are obviously going to be more information that is sought.

I think when we see FHIR and FHIR and APIs come into play, as they surely will, there may be additional kinds of information there that is deliverable as data or metadata with whatever transport mechanism we use to deliver that request or that push message.

So, overall this is working out very well. We think we will probably double the number of entries in our directory aggregation service over the next few months but it is going to be challenging to make sure that we can do that and whatever we do scales.

So, one of the things we are very interested in, and I will be talking with many of you about, is how can we work together with you to collaborate on those ultimate standards for the technology involved. Thanks.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you. We have time for maybe one or two question.

Linda Van Horn, MBA – President and Chief Executive Officer – iShare Medical

I guess mine is a little bit of a comment too, Linda Van Horn, iShare Medical we are a DirectTrust EHNAC accredited HISP and an anchor and I just wanted to mention that something that Dr. Kibbe said but just to emphasize it, what we do in DirectTrust is we ID proof the individual and assign them a credential and it is similar to having a driver's license or passport so when we interrogate that Direct address we know who they are, we know attributes about them, if it is a patient or whatever and I think that is what makes the DirectTrust thing so powerful.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Thank you.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Others?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

So, there is an issue with adding unique identifiers for all providers including those that do not have an NPI number and it seems like there is an opportunity for the Direct address to be a unique identifier, but if you look at the Direct address names they vary widely from HISP to HISP and vendor. Is there any discussion or plan to have a standard naming convention for Direct addresses to support that as a unique identifier?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Could you please state your name?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Jeff Livesay from MiHIN.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Yes, Jeff, you always ask great questions. First of all a number of people have, as yourself, understood that a unique Direct address abound to a unique certificate is potentially a very strong identifier and not just for providers but for patients, all right, so it could be one of the ways we leverage what DirectTrust, and you are a member of DirectTrust, has accomplish.

I think that in the HISP policy, which was one of our standard policies in the security trust framework, we have recommended as a convention that the DirectTrust address be something like name at direct dot name of organization could be then name of supplier dot org dot net dot com and we have had this conversation almost every year, maybe every six months it comes up in the security and trust compliance workgroup and if you think we need to re-examine it let's do it.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Last one real quick.

Fred Trotter – Founder and Healthcare Data Journalist – Not Only Dev

So, the direct network is not capable of spam. Spam by definition is e-mail sent that is insecure and one side of it is coming from a mass address. We have both sides secured so we cannot have spam...

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

I should have said junk mail.

Fred Trotter – Founder and Healthcare Data Journalist – Not Only Dev

Sure.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Okay.

Fred Trotter – Founder and Healthcare Data Journalist – Not Only Dev

But that's actually my point which is to say, you said that they were very concerned about getting unrequested messages so it seems like what they are interested in is not publishing Direct addresses in an open way so that people cannot send them messages for interoperability. I mean, I just do not understand what the difference is between unrequested messages and interoperability.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

In this regard I'm the messenger, I tend to agree with you, I wish there was more openness with respect to that information because it is public anyway. So, I do not have a problem with it but Bruce might want to respond to that.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Quickly, please.

Bruce Schreiber, MS – Chief Technology Officer – MaxMD

My name is Bruce Schreiber I'm the Co-Chair of the DirectTrust Directory Policy Workgroup. Jim Fisher, my Co-Chair is sitting next to me. What we are talking about relative to spam is unsolicited messages, you know who the message is coming from so it is not anonymous, but we are concerned about, as an example, commercial entities, a device provider deciding that he can get a list of providers and send out solicitations with commercial sales solicitations to a list of providers and that is the kind of unwanted messaging that we are talking about. It can be blocked pretty quickly, we will react to it and the HISP certainly can blacklist and not trust certain sources but that is what we are talking about when we talk about spam and unsolicited messaging.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Thank you for bringing that up though Fred because this is something we should discuss in our conversations during the day.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Yes and I think that will be important as we move forward. Tomorrow one of the things we want to talk about is access to the directories and although this is not a meeting about exchange of information some of what we are talking about in provider directories drive exchange and so access to the directories is going to be important. Thanks, David, I think we need to move on.

Our next speaker is Eric Heflin. Eric comes to us from The Sequoia Project where he is the CTO.

Eric Heflin – Chief Technology Officer – Sequoia Project/HIETexas

Well, good afternoon everybody, thank you very much to ONC for convening us today and bringing us all together to talk about the about this important topic and I just want to recognize too, a couple of colleagues in the back sitting over there, Marty and Tom from the SSA they actually really in the SSA envisioned probably this discussion occurring as of about 10 years ago. They actually were involved with the creation of one of the first provider directories or first directory technologies out there and they actually contracted with somebody to work with them to help create the first version of the HPD standard. I have to clarify that one point, IHE does produce standards. So, the agenda is actually the same level for anybody as to the details as HL7, they are both accredited under ANSI so it is a standards body.

I want to talk about today briefly a few topics here, why provider directories and directories are a strategic priority for the organizations I happen to be associated with and then talk about some use cases that I think really need to drive this whole discussion as opposed to technology. It kind of pains me to say this, I'm a technologist, I still code on weekends just for fun, but this should not be driven by technology it has to be driven by clinical and business use cases and then some references for follow-up information.

So, I actually have the honor of really being associated with about four organizations that are kind of relevant to this discussion today. I am CTO of The Sequoia Project which has three initiatives. I am also the CTO of the State of Texas. I am also Co-Author of HPD with the IHE I am also a member of and then also involved with FHIR REST activities with HL7 and so I actually have multiple hats and I am actually neutral in my agenda and I am trying to be very transparent about this, I am just trying to connect everybody securely to get patient data flowing that is my only agenda and that is why you actually will see potentially some interesting contradictory efforts I am both involved with for example I am involved with one hand the FHIR work and FHIR directories as well as on the other hand IHE and HPD directories too.

I do not care what we choose let's just choose one though that is my only goal and let's choose one that is adequate that gives everybody a single standard to shoot for.

So, with my Texas hat on we were created by legislature so we are the state designated entity equivalent within the State of Texas. We operate a network and are creating a network of networks model, it is a mini eHealth exchange or mini NHIN within the State of Texas. We are approaching 30 million citizens in the state we are trying to service and we have a regional model with funds from the Cooperative Agreement Program in partnership with our State Health and Human Services Commission.

We have active HIEs live in production in Houston and Austin, San Antonio and Dallas are coming on line any day now and we have others pending throughout the rest of the state as well too.

One of our drivers in Texas being a coastal state is disaster response. During Katrina we actually had a lot of people who came to our state during the disaster that we experience within our state others migrate to other states as well too. We have a Disaster Response Planning Commission and we have identified provider directories as one of the key elements to help us more effectively treat citizens displaced.

We are also a conservative state in terms of privacy and that is actually germane to this discussion. We actually, for example in Houston, they do not participate in our statewide record locator service because they want to only share patient data during the course of treatment for example. Our Austin HIE actually shares the data with us proactively so we know in advance what patients have been seen within Austin and we know whether or not to direct a query to them.

It is also relevant because computable consent is on our roadmap as well too and so we think provider directories and computable consent actually will work very well together and it is very important and imperative for us.

We also are leveraging open standards throughout the state, everything we do is non-proprietary. In a few cases where there were no solutions we actually helped try to create some solutions. For example, HPD, which I will talk about later on today, has been found to be inadequate in a number of areas. Well, we did not see better standards and so we jumped in and tried to help make HPD more adequate to help meet more needs and also the same thing with FHIR, we see that FHIR solutions out there are not mature, they are not defined, they are not usable today as far as directories quite yet and so we are actually jumping in to try to help drive that.

And actually I've gotten invitations to a number of organizations that have stated before me saying "there is a lot work going on, we've got a lot problems with those standards or we are just creating new things on the fly." I implore you, please talk to the community creating these standards. If you have any questions on how to engage reach out to me, reach out to Brett over there, Brett Marquard, reach out to others involved in standards do not sit back and you are not a passive observer in this process you have to get actively involved in helping solve this problem and how to do that join the IHE, join the ITI Technical Committee, which is a committee I co-chair, our focus is solely on standards involving interoperability between HIEs essentially and across organizational boundaries. Join HL7, work with them as well too.

Do not create your own standards. Do not complain about how HPD or other standards are not adequate, tell us about it, we actually have a list of known defects and known gaps in HPD. Some of the things discussed this morning are not on that list so tell us about those otherwise you are causing part of the problem as well. You can be part of the solution so let's go that approach.

Local HIE directories are very important to us. We have a regional strategy, we want to support our local HIEs, we do not want to compete with them and to a fault we try to support them. They have their own directories, we want to leverage those directories rather than replicate them.

We also want to have a virtual directory for the state. So, basically there is one entry point for the whole state that actually allows you to query and obtain, for example, a HISP address or all Direct e-mail address, all electronic service end-points for non-Direct project e-mails and so on. That cannot be done if we maintain all the data at the state level where essentially my organization exists, because our information is by definition, several levels removed and out of date immediately upon receipt. We feel it has to be maintained at the place where the organization is incentivized to maintain the data correctly and accurately meaning the hospitals and the local HIEs.

We also want to leverage our medical association and others. The State of Texas, Texas Medical Association, which is the credentialing entity actually has a provider directory but they maintain it so well they are contracted by 13 other states to maintain their provider directories as well too. We want to leverage that if at all possible. We do not want to replicate any of that data. They are authoritative. They do a good job at it. We want to leverage that.

So, in terms of The Sequoia Project, how many people have heard of The Sequoia Project so I know how little or how much to say? Okay. I'll skip the background on that then. Bottom line, we have, I'm in the middle of my slide now, we have three initiatives, we have RSNA image share, that's a validation

program for a national strategy for image sharing. We have eHealth Exchange formally known as the NHIN or NwHIN Exchange and then Carequality. All those essentially are networks of networks models.

It is a strategic priority for The Sequoia Project because of scalability. We are purely federated. There is a lot of controversy about federated architecture versus centralized. I think there are benefits and drawbacks to both.

A federated architecture can be light, simpler, easier to deploy, less costly to maintain but also it does not give you centralized services in some area. So one thing we decided to do, about 10 years ago, was actually create a centralized directory service and we have been operating and maintaining that live in production essentially since then and we are live still today with that same directory.

But we want to align with other initiatives. I actually helped create the eHealth Exchange standard about using our current directory approach and I voted for it, but even back then I was actually opposed to it because I just did not think the UDDI approach, which is what we are using, had legs. I did not think it was a long-term viable approach. It was designed for eCommerce and looking up consumers on a white page or vendors on a white page or yellow page.

But since then I have been looking for a better solution and I think really we have two choices out today, either FHIR-based approach or an HPD-based approach. And frankly, as a technologist, I think we can make either one work. It comes down to preferences. It comes down to really a decision we have to make as a country.

We also, for both Texas and Sequoia plan on having a federation model not necessarily federation although that may be our approach, but some type of a way where we can actually not maintain a single authoritative directory for the country. We have said we want to maintain directories of directories. We want to point to Dr. Kibbe's directory if that seems relevant. We want to point to state directories. We want to point to federal agency directories anybody basically that has a directory that would like to share it and it seems like it is high quality maintained data, we actually want to federate to that. So, essentially a ping to us could ultimately result in a ping to other organizations. But immediately that is for a broad scale for directory architecture.

Our current immediate need though is today we have a directory deployed in production for essentially electronic services discovery of electronic end-points using SOAP and IHE profiles. And so basically they will look up an organization to exchange with based on their name, based on what states they cover, based on what versions of services they offer and so on, that's our main use case for today.

We also think though that directories will work hand and glove with consent models. We are actually, on Sequoia with Carequality, standing up the consent model and also eHealth Exchange has a consent model in place that actually the Social Security Administration is in production with now and has been for many years which allows expression of patient consents. Today it is basically an ID saying "here's the document I've signed."

In the future though we want this to be based on computable rules such as 42 CFR Part 2, point-to-point authorization or specific opt in or opt out kind of rules such as “I as a patient would like to share information for this purpose within this context between these dates but not for this purpose for this context within these dates.” Well those actually are relatively easy rules to express, there is already a standard out there that does that and as an evolving standard the IHE is working in...to actually enhance that called enhanced patient privacy consents, but in order for that to be fully computable though the rule is easy. What is hard right now is what are the subjects to that rule, specifically the hospitals or the physicians of which the patient wants to express a preference and so provider directory actually provides, I think, an answer to that.

If you have a provider directory that is brought up in parallel and maintained in parallel with the consent model and consent specification then they work better together because then a consent rule can say, with respect to this specific physician, as identified here, and this specific HIE as identified from the provider directory here, here is how I am expressing my preferences. So, they work very powerfully together.

Also, for The Sequoia Project, particularly the Carequality, provider directories are actually part of the business model. So, organizations actually listed within the directory once and is issued a certificate for digital, X.509 certificate, once it has met certain business and legal obligations, specifically they create a common trust framework.

The directory, automation is a key for the directory. The eHealth Exchange is all about automation. We are trying to provide automatic responses to queries, automatic lookup of locations and trading partners, automatic processing of inbound documents for example patient matching. Directory automation is no exception.

We actually maintain, my team actually maintains, the directory today and we have automated that. It was actually originally a manual process when we inherited from the ONC in 2012 and we have invested in automation. So, now I have one tool that basically can maintain our existing directory through a simple automation process and it includes quality assurance of the data that are actually built into automated rules to kick out directory entries with common errors and we enhance that continuously so as you find more quality problems we actually put in more rules to solve the problem once and for all and we, from then on, detect that problem automatically.

So, one other kind of a subtle use for any security individuals on the virtual meeting or in the audience is we are also doing something kind of groundbreaking as far as technical trust models and specifically we are using our directory to have multiple trust domains expressed in the directory. So, for example, Sequoia has eHealth Exchange over here that we operate for participants. We have the Carequality network over here our network of networks over here, how do organizations interoperate between those two networks?

Well one way of expressing that is through the directory by basically saying an organization is actually a member of multiple trust models and therefore actually meets the requirements of exchange under either trust model. I think that extends.

So, we have talked about some of these topics already. One thing Texas has published a specification, I wrote that about three year ago and it is on the website, I've got a reference to it here in case you have an interest, it is actually becoming superseded now this year by IHE work which I am actually glad that's a good thing because Texas does not want to do something in isolation we would rather use an existing standard. So, we have a specification out there already that you can feel free to publish and pull down, it is freely available on use of computable consents and provider directories.

In Texas we took the approach of saying "we don't know what to do next you tell us." So, we asked our local HIEs, we asked our medical associations, our hospital associations, our broadest possible community stakeholder groups what were their priorities for us for the next cycle, which represented our phase 3 of deployment and we gave them six choices and one of the top three choices was provider directory for the next set of development services.

The other interesting thing is that event notifications was another top three choice. Well, event notifications, the way we are architecting it requires a provider directory, so that actually worked out well, because how do you actually know who to a message to unless you know information about that individual and very importantly the relationship of that individual to those treating them. So, they actually work well together. In isolation there is a piece of the puzzle that is missing.

We also applied for a...match program through Medicaid IAPD for those familiar with that program and we got it so we are actually now in the process of trying to connect our contract with our commission to essentially put that in place. So, I expect we have some nice in-match funding that we will be able to leverage this year to build out our provider directory services at least for the Medicaid side.

I want to wrap up with basically what I think really should drive this whole discussion, in my mind, which has nothing to do with technology. So, the S&I Framework, Mod Spec Project, the eHealth Exchange, IHE and HL7 they all had conversations including many more conversations that have been referenced earlier about what we are trying to do, what is the definition of provider directory, what we are trying to accomplish and so what we have done, this is actually a list of use cases that have been created, they are derived from the IHE use cases, they are derived from the ONC's Mod Spec and S&I Framework use cases and others. So, this is a list of the current use cases and this I think is key because this is driving the new work for the IHE USA National Extension that is undergoing right now as well as the FHIR directory work which just started last week in earnest.

So, we have to get these use cases right and I think they are incomplete and I think we need your help to flesh these out and to define these. Obviously, this is just a list of use case titles. We need to flesh out the use case definitions as well too.

The key one is to identify people based on attributes or organizations based on attributes such as geography, language spoken, credentials, maybe the gender, the physician perhaps treating them, electronic service address capability, maybe somebody wants to exchange using Direct e-mail, maybe they want to exchange using IHE profiles put that information is an attribute.

We also want to identify people and organizations based on relationships such as, does this person have a relationship with this hospital or does this hospital have a clinic in my area, that was actually a subtle key issue and it turned out to be a very important use case or really kind of a sub use case.

Also, another use case that I was thinking originally would be outside of scope but it recently has become clearly inside scope is administrative transactions specifically, how do we keep our data correct and current within the directories.

Typically standards bodies like IHE say “we’re not going to deal with administrative transactions, that is outside of scope, we are dealing with interoperability.” But it has become such a key issue that this is actually probably now in scope of provider directory discussions of how do we get the directory information current, how do we get an historical backload with our partners and how do we keep that information current on an ongoing basis and that can be federation in real-time, it could be aggregation in batch modes, it could be subscription service such as a publish, described business model, it could be real-time, it could be once a month depending on the relevant business needs but that obviously cannot be second-class to us in this discussion because among other things that is an interoperability issue. For example, federation you need to do data elements to be exchanged.

Also, retrieving objects such as certificates that may or may not be use case. HPD tried to take into account the needs of the Direct Project, it was specifically put in there X.509 certificate retrieval was part of the use case, however, it looks like that may not be needed so if it is not we should probably remove that.

Also, discovery of electronic services is a key use case. Targeting consent expression objects is a use case and then a new one, and actually my friends from Michigan were the ones that provided this use case, was actually maintaining not only directories for physicians and hospitals and practices but also a patient potentially as well too.

So, with that there is a little bit of cross reference information here in case you would like to drill down. I am actually leading the work for the HPD USA National Extension this year under the direction and approval of IHE USA Board of Directors and I’m involved with the Argonaut Workgroup.

Brett, raise your hand, Brett Marquard, he is also driving the work for the Argonauts and the FHIR-based directory, but the key here is I’m presenting these use cases to both workgroups saying “is this what we need to do?” Because I think it really should be independent of the technology that we are trying to use to accomplish this. So, then I think we have a moment for questions perhaps and thank you.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you, Eric. Well, we are at time for lunch. Why don’t we do one question, if there is one important question? You guys want to go eat don’t you? All right, let’s go ahead and break for lunch then. Just real quick there is a cafeteria within the building here, it is a secure facility so people need to be escorted up, it is upstairs. There will be escorts outside at the registration desk, we can take people up in batches. If you

have questions for any of the speakers this morning I still have pads up here, come either see me I'll be hanging out over here for a while. Thank you, we will start again promptly at 1:00 o'clock so please be back down here.

Lunch Break

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right are we good?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

I believe we are good and welcome back virtual presenters, we quite do not know how that line dropped but I believe you are back now.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you, so our next speakers are from MITRE it is Vanitha Khetan and Peter Krautscheid, and they are going to be talking to us about the Federal Health Architecture Provider Directory Prototype effort. Go ahead?

Vanitha Khetan – Principal Engineer – MITRE Corporation

Hi, I am Vanitha Khetan and I was the Project Lead, the MITRE Project Lead, when we developed the Healthcare Provider Directory Prototype. I am actually going to hand it right over to Pete, he was the Lead Engineer who worked with the FHA Workgroup, the Healthcare Directory Workgroup to identify the requirements, work out the design elements and then oversee the development and actually collaborated with the workgroup throughout. So, here is Pete.

Peter W. Krautscheid – Lead Software Systems Engineer – MITRE Corporation

Thanks, Vanitha. So, this is a presentation about a project that we completed about six months ago working with the FHA. It is a healthcare provider directory prototype. So, briefly this is what I will be talking about. So, I will talk about some of the goals that we had when building this, some of the functionality that we actually implemented including a little bit of information on the architecture that we used and I will focus a bit on the fact that we implemented three different machine interfaces, I will get into that somewhat, along with a demo of one of our interfaces and then some of the analysis of the work that we did.

So, the purpose of this prototype was to explore some of the technical considerations required to build a healthcare directory for our federal partners and the focus was very much on the technical side of the work. We wanted to deliver an actual working piece of directory software that demonstrated some of the different facets of a successful provider directory. We wanted to explore some of the relevant standards like IHE HPD and FHIR. We wanted to expose both human and machine interfaces for maximum flexibility.

One of the things we looked at was looking at complex queries, so queries where you are trying to get information on the provider and their relationship to an organization and then look at some approaches for information verification and reliability.

One of the important things we wanted to do was work together with the FHA Directory Workgroup in this project. I think in a little while you will be hearing from Bob Dieterle about that Workgroup effort not related to this particular project but our goal was to work with that Workgroup to try to get a sense from them of what questions they had so that we could build something to try to address some of their questions and concerns.

So, for our prototype we took a dataset that we could use that had a broad-base of data. So, we took information from the NPDES dataset as well as the Physician Compare organization dataset, we tried to combine a couple of different publically available datasets to get a more cohesive collection of data.

And then we built on top of our data store a RESTful interface and this is designed for machine-to-machine communication. This interface supported things that I mentioned earlier like searching by basic information, complex queries and things like geospatial search and again I will show you that in just a moment.

What I will show you is actually a web interface that we built on top of this RESTful interface and the goal there was...as humans we cannot really look at machine-to-machine interfaces and get a lot of interesting information out of them. So, we built a human interface on top of it so we can see what sort of functionality it offers.

Then we also built a FHIR interface and an IHE HPD interface just to show different approaches of interacting with healthcare provider information.

So, this is a picture of our high-level architecture. So, as I mentioned we had a couple of different data sources, this could certainly be extended to include more sources of provider and organization data. As our backing store we used a Postgres database. We used Postgres because it provides some pretty rich search features as well as some geospatial search features that we made use of.

On top of that backend we built an application service tier using Rails, Ruby on Rails, and this has the three machine interfaces that I just mentioned earlier RESTful interface, FHIR interface and an HPD interface and then of course on the far right our user interfaces, we just built a single web interface, but really this approach would be useful for a lot of different contexts.

The benefit of having a machine interface is that you can integrate it with existing applications you can write new applications that use it in a lot of different context. You can imagine it might be useful in a billing context, in a fraud detection context, in an EHR any place where provider information needs to be looked up you can make use of machine interfaces.

So, the basic RESTful interface, this is a very simple interface to the application and very briefly, this is what it looks like when a query is made to this type of interface. So, the request is very simple. You can see that it is querying providers and it is looking for a provider that matches both Smith and Pediatrics. And below that, in red, you can see the response, it has some information about how many results and it is not surprising information that there are 850 providers named Smith in Pediatrics as well as the actual provider information itself.

Now it is interesting to see how this works, but it is not actually a very useful thing for us to look at in terms of what does this actually provide from a functionality perspective? So, what I am going to do right now is give a very brief demo of our user interface that talks to this RESTful backend.

So, I am going to start with a very simple search for Smith and not surprisingly there are over 27,000 providers named Smith in the NPPES dataset and we could page through this 10 providers at a time to get to the one we are looking for, but that is not a really useful approach for searching through data.

So, we can refine our results a little bit by adding some more information let's just say we are interested in looking for a provider named Smith in Pediatrics. We can add that to our search here and we are down to 850 results and you can see that this actually is the exact query that I just showed you, the screen earlier, what is going on behind the scenes is that this web application is sending that exact query to our backend service which is responding with information on the actual providers being searched for.

And we can go ahead and refine our query even further with some organization information, for example, we want a Pediatrician named Smith at Johns Hopkins and you can see we have simplified our results down to three which is a much easier place to start looking for the actual Smith that we are looking for.

So, if we click into an individual provider that has been returned by this search we can get some specific information. We can see group affiliations for this provider, in this case Johns Hopkins, one of the things we looked at is the ability for a service like this to provide ESI or Electronic Service Information so in this case we generated some fake e-mail addresses representing Direct Project e-mail addresses and so this type of service could be used for looking for contact information for a provider for secure communication and of course we have location information, maps, basically anything that you might present on a website is very easy to build in a frontend that makes use of a machine interface backend like I mentioned.

So, I just showed a search where we just entered some search terms in a single search box that is not necessarily very smart. For example, Smith returns individuals named Smith but it also returns people who happen to live in Fort Smith. So, we might want to be a little bit more granular in how we are searching. So, we can search with a parameterized approach where we can break out the individual fields.

So, here I am just going to go ahead and do the same search and you can see we can start to provide some useful features like completion, this is again a service that is provided by that backend interface and we can add our organization and you can see we are getting the same search results.

So, in addition to searching for providers where we have all the information that we need we can also do searches if we just have partial information. For example, my last name is Krautscheid it has a lot of letters in it, it is hard to spell, if somebody has a physician with a name where they remember part of it we can actually...it is also difficult to spell for me, we can provide some partial information and actually get search results back, if somebody remembers just part of a doctor's name we can still search for that provider or organization and in this case there is somebody who shares a last name with me, I think this is a distant cousin of mine.

We can also search with a certain amount of uncertain information. You can imagine a scenario where an individual has lived in multiple places, you want to be able to search for that individual's providers in both of those places. So, in this case I'm going to search for a provider named Kane and let's just say that we know that the person with this provider lived in both Miami or Chicago and again let's pick a specialty of Pediatrics and you can see that we have a result in Miami and a result in Chicago and from here we can find the particular provider that maybe of interest for this patient that we may be looking for information for.

And then the final thing I will show you in the demo is geospatial search. So, a geospatial search basically means searching within a particular radius using, in this case zip codes, and then finding providers or organizations within that radius.

So, in this case I'll search for providers named Smith within one mile of the zip code 21202 and again in Pediatrics and you can see we have four search results in this radius, we can decrease the radius to half a mile and you can see our search results become more specific. So, that is the user interface that we built on top of a RESTful backend.

Now I mentioned multiple different back-ends. So, there are a number of different approaches for providing access to data. A RESTful interface has a lot of benefits but it is not necessarily directly standards compliant. If we want to look at standards specifically FHIR is a standard that might map fairly well to this particular problem of searching for providers and organizations. FHIR provides resources for practitioners and for organizations that represent a lot of the data that you would be looking for in a provider directory.

And just very briefly, this represents that same type of query we just looked at before but in the context of FHIR. So, you can see that it is a very similar approach to what I just showed you earlier, but this is actually making use of the FHIR standard.

And then finally, I am going to talk about IHE HPD. In this case IHE HPD is probably the current standard for provider directories so it has a lot of history in this area. It makes use of behind the scenes SOAP and DSML as its interface language and you can see this particular query right here represents a query for a provider with the name of Thomas and you can see you are not intended to read this but you can see that the actual query to represent this simple concept is a lot more complex than the queries I showed earlier.

So, there is a fair amount of overhead when dealing with IHE HPD that a developer for example would need to deal with. And obviously there is tooling that can help with that but there is a certain amount of cognitive overhead. So, how are we doing on time?

All right, so I talked a little bit about some of the benefits of these three different interfaces. IHE HPD is the current standard supporting this and it is the only standard right now that is directed primarily at the healthcare directories and there are a lot of pilot efforts as we have heard earlier today that have demonstrated working with this particular standard. There are other approaches that may work as well.

At HIMSS, not that long ago, Micky Tripathi was asked I think a difficult question about FHIR in relation to C-CDA and whether we can just jump forward into new standards or whether we need to actually take the time and fix existing standards and his answer was that we actually do need to focus on the existing standards. It is exciting, particularly from a technologist perspective, to jump ahead into new things and I would definitely encourage a lot of investigation of new approaches, but I think that needs to be taken with some practicality as well.

And then findings and lessons learned I am going to skip this and talk briefly about challenges. This project focused primarily on the technical aspects. I think a lot of the biggest challenges are not technical in nature. It is pretty easy to put together a piece of software to support some required functionality but data stewardship and other governance issues are probably going to be a lot more difficult than the actual technical problems.

And I think that another challenge is that different target environments are going to have different querying requirements, right, the use for looking at fraud is going to be a lot different than the use for billing and I think any directory will need to support lots of different use cases.

And then I'll close with just some recommended next steps. These are directed very specifically at this sort of prototype effort. I think that to get more value out of this type of work where you are exploring technical questions actually piloting it in a production environment will give a lot more answers about what is actually necessary to support the actual use cases that we will see in the real world.

So, this project finished up in September of 2015 that was some time ago. This project is entirely open source, it is available online at GitHub so anybody who is interested in looking at the work that we have done can look on GitHub see our source code it is documented including information for getting it set up. We are also very happy to answer any questions that people have either via e-mail or otherwise and hopefully somebody will find this useful.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you.

Peter W. Krautscheid – Lead Software Systems Engineer – MITRE Corporation

Thanks very much.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Are there any questions? So, we are all in the post lunch sleepy time now.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Yeah, hi, Peter, Jeff Livesay from MiHIN, nice presentation, thank you. Near the end you mentioned getting end-user involvement. So for your pilot who are the end-users?

Peter W. Krautscheid – Lead Software Systems Engineer – MITRE Corporation

That is a great question and it is something I tried to touch on at the end. So, this was a prototype not a pilot. We did not have end-users so this was more a technical exploration of this space. I think that to take this project to the next step piloting it would actually give us a lot more information.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

So, what types of end-users would you approach in a pilot?

Peter W. Krautscheid – Lead Software Systems Engineer – MITRE Corporation

So, this was definitely targeted at federal partners at least that is what the FHA Workgroup was focused on so that is what we focused on. But really it is an open source project and that gives it a lot of flexibility and it certainly is available to use in any context.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Thanks.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Any other questions? All right, we will move on. Just a quick note before we move onto the next speaker and get things switched over, there is a public-facing website that we have put together to support the workshop today, over time that may migrate to someplace else, but you will find, as I mentioned earlier, all of the presentations posted there. You are also going to find some resources. So, for instance the GitHub site where this code is listed is up on the website there also and so you should explore a little bit some of the materials that are there and if there are other materials that people that are here want to get posted up there either send me a note or send Dan a note and we may be able to get some other things up there as well.

All right now we will move onto our next speaker, Richard Gilbert from CMS, the Director of Division for Enrollment Systems is going to talk to us a little bit about NPPES.

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

Good afternoon, myself and the team at CMS are responsible for a number of provider related systems PECOS, NPPES and the Advanced Provider Screening System. So, over the last year I have been fortunate enough to be part of at least five different workgroups on provider directories and probably talked with half a dozen private companies who are developing some sort of provider directory type product. So, I am very encouraged by the presentations I have seen today and some of the conversations that I have heard in the room.

My goal here is not to get into a lot of detail about where we are with NPPES but to provide an overview of where we were and sort of where we are going and some of the objectives that we have. So, I also want to make sure that I get a chance to get feedback from you all. I think it was mentioned earlier getting feedback from the community not just the provider community but everybody in this room who has a vested interest in NPPES is really important to us.

I will skip over most of this slide, I think everybody in the room is pretty comfortable on what NPPES is. The only thing to note is that when we are developing or registering a provider for an NPI we are doing some validation related to social security number, date of birth, name and also the fact that organizations can have multiple NPIs it is not always clear in the conversations that we have. So, an individual clinician is going to have one NPI but a hospital could have multiple for each one of their departments, a group could have one for each one of their locations. So, that is something to take into account.

4.6 million NPIs exist today, we are increasing it about 300,000 a year and 70% of those, about 3.2 million are individuals. So, fairly substantial numbers when we start thinking about the data that we need to maintain and keep current, 93% of the applications are coming in online, we hope to increase that closer to 100% with some of the changes that I will talk about in a little bit.

So, in 2005 people basically looked at NPPES as a number generating system, that is fine, I got my number, move on. Today it has evolved and it was not evolved by CMS it was evolved by the industry. People started saying, well, okay NPPES is a large source of provider information, it is the single largest publically available source that I'm aware of and why not make it part of a directory?

So, we took a step back and started thinking, okay, well, if the industry sees NPPES as a directory maybe we need to start thinking about that too. So, what kind of challenges is that going to present for us? Well for starters we needed to think about our users. We did not actually know who our users were when we started looking at NPPES. We thought "oh, it's the provider, they are going in, they are getting this information." And that is not even close to the way providers work today. It is their support teams.

We had expectations that they were maintaining their data, again, not even close. We expected them to come in every 30 days and update their information and they had a "set it and forget it" mentality right after they left med school.

So, usability, the data, so the system interfaces as well as the user interfaces are all kind of cumbersome and there is certainly a lack of clarity in the information as far as why they need to provide it, where this information could be used.

So, with those challenges in mind we came up with three objectives, increase accessibility, increase relevance and increase integrity.

So, when we start talking about accessibility for NPPES we mean accessibility in every sense of the word, so, yes, we need to adopt more industry standard design, practices for the interface, we need to implement plain language, make sure there is a clarity as to why people are working with NPPES and we needed to reduce the provider burden. So, how do we acknowledge the support teams that are actually doing all of the work that we are talking about here today? And then how do we move some more real-time services so you are not downloading 4.6 million NPIs every time you want to check something.

So, relevance, we realized that we want current information. In order to get current information we have to have people maintaining it. In order to get people to maintain it they have to want to go to the site and they are just going there. So, that is because it is not relevant to their business. It does not help them solve any problems and we do not stop their payment if they do not update it.

So, how do we expand the value to the provider community so we are actually helping them solve problems? How do we align with other programs?

If we can impact their bottom line through partnering or coordination with other programs then they will start to take a little bit more notice and maintain their information.

And then as a last point, very important for the conversation today, what is NPPES's role in the provider directory space? If you start thinking about providers as clinicians or hospitals or group practices NPPES is a really good base but if you start thinking about Medicaid and the different populations there where does a community health worker fall? Where does a foster family fall? These are all people that are working in the system but they are not going to have an NPI and they are not going to show up in this dataset. So, while NPPES has a role to play it is certainly not the definitive role.

Then increasing integrity, so this is really important to us at CMS, particularly in provider enrollment, we are within the Center for Program Integrity and we want to make sure that we have consistency in the records, we want to make sure that we are validating the records, what else can we do to make sure that this information is as solid as possible? How can we recertify these records? How can we make sure that the providers are committing that this is the information I want the public to know about me.

And then how do we shift our thinking for fraud prevention? So, if the standard model for healthcare is go get an NPI then move to Medicare, Medicaid, private payers, get credentialed and then start submitting claims, well if that is also the process for fraud we at NPPES are at the front door. If we are the first step that somebody has to take in order to commit fraud what should we be doing in that arena?

So, based on those objectives we started doing a lot of work, started in 2014 engaging HHS entrepreneur, Mr. Alan Viars, I think he is going to be talking to you guys later today, he really was instrumental in kick starting the modernization of NPPES. So, we started working with the industry, talking with a lot of

you opening up for discussion, looking at different technologies, shifting to more open source technology, re-imaging what the NPPES system could be, should be and then also certainly thinking about how that data was going to get distributed out.

At the end of last year we released the public search, this was taking the prototype that Alan built, while an entrepreneur with CMS, and putting it into production. So, I found out the other day that not everybody may know that. There is now a RESTful service out of NPPES that is real-time. So, you can go there, I think Jeff mentioned the other day that he did it while we were on a phone call, so, yeah, okay, integrated it, it's great, thanks.

So, we also switched to a totally new technology stack. We made some operational improvements. So, now NPPES is connected to PECOS which is the system for Medicare fee-for-service enrollment. So, any time somebody updates their Medicare enrollment information, which they are required to do, we will cut off their payment if they don't do that, then they have the option of updating their NPI record.

We made some changes at the call center, at the enumerator. A couple of tweaks to how they are working, impacted or removed about 30,000 phone calls a year, small change, big impact. So, we are looking for more of those types of things.

Later this year you are going to see a whole new look for NPPES. We are going to be changing the workflow, we are going to be changing the visual design, we are going to be adding a lot of plain language and explaining what the purpose of NPPES is in today's space, that it is not a number generating system, that it is a system that is, yes, going to give you an NPI that you are going to need for your other business but how it is also going to support all the work that we are talking about here today.

We are going to implement surrogacy which is our term for delegation of authority. So, users who are supporting teams of 100, 1000, 10,000 are not logging into NPPES 100, 1000 or 10,000 times. We are going to make sure that they can do bulk modifications. So, again, the groups that support these providers are managing large, large numbers and they need better tools. If they have to do it one by one the way do now they are just not going to maintain the information.

We are going to be adding more fields so we are adding the Direct addresses. We are going to be adding options for additional physical addresses and we are also evaluating other things a lot of that based on feedback that we received from either this group, different people we have talked with here, or things that we have heard from the provider community that they want to have access to in order to help solve their problem.

So, we are also going to be looking at reporting and analysis. There are a lot of valuable data within NPPES and we want to make sure that we are trying to get that out to the community so it can be used.

The end of this year, as in December 31st the end of this year, we are going to be helping the community by helping ourselves. There are a lot of backend processes, a lot of bottlenecks that occur in managing

NPPES so we are going to be looking at the toolsets that we are using. The better tools that we can use to maintain the system the more time and resources we can spend on improving it.

So, we are also going to look at integrity. We have a lot of other trusted datasets that we use within CMS and we are going to start looking at NPPES in relation to those sources and starting a dialogue with the provider community, saying “you know what we’ve looked at your information in some other places that we kind of trust and we think you may want to take a look at your NPI record because it matters.”

So, then as we move into 2017 we are going to be looking at technology, looking at how to implement more of the open source and some of the things that Alan recommended when he was an entrepreneur and also answering the other big API question that everybody has is “when are you going to let me push information into NPPES?” That is a big ask from pretty much everybody that we talk to “hey, we have an API, we want to just load information in.” There are a lot of security questions, there are a lot of technical hurdles that we have to get through on that but we know that this is a question we have to answer. We do not have the answer today but we are going to be working towards that in 2017.

So, with that I got the yellow card so that means I have a couple minutes for questions and I wanted to make sure I got a chance to answer at least a couple.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Thank you, very good presentation, David Kibbe of DirectTrust. What is the overall budget for NPPES and what are the increases that you are asking for whenever the next budget cycle is for you?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

So, I would have to get back to you on what the exact budget is for NPPES.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Okay, can you give us a guess?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

No.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

Not even a guess?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

No, no, really it is not something that I keep on top of my mind.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

All right.

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

Less than marketplace.

David C. Kibbe, MD, MBA – President & CEO – DirectTrust.org, Inc.; Senior Advisor – American Academy of Family Physicians

All right I'll take your word for it, thank you.

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

Hi, John Donnelly from InterPro, to the Direct address plans, thoughts as to how you might source that? Are you looking to tap other repositories of that? Because as you heard today we've got a number of places where maybe Direct addresses are already stored, so just thoughts in that regard?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

That is a good question and that is one of the challenges that we face as the NPPES system. We have to have the providers certifying the information. So, we are still figuring out what flexibility we have with loading in other data. If it is definitive system of record information then we can work with it and trust it a little bit more but that is a challenge that we have. Right now initially we are just talking about provider loaded data.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

So, Richard, in speaking with...Jeff Livesay from Michigan, speaking with other colleagues in other states, getting data from the state licensure agencies is challenging at best and in your considerations of additional data to add, any thoughts to adding the ability for us to get, from the NPPES, whether a provider has a valid license or for NPPES to push disciplinary actions such as suspensions and revocations?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

We are looking into licensure information as one of the things that we want to start validating and working with more. At the point where we have more confidence in that type of information we would look to start distributing it.

Ellen Hansen – Marketplace Manager - Cigna

Hi, I am Ellen Hansen with Cigna, one of the...speaking of the marketplace I was wondering how much you worked with the machine readable team and how they developed the provider search tools for healthcare.gov?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

So, I don't work with marketplace, it is hard to even see it from where I am, but I did have conversations with the marketplace team when they started building their machine readable directories and it was conversations about challenges that we knew that they would have when they started trying to aggregate the data together so we passed on some insight that we had about the fact that your NPIs are going to be one too many for your organizations and you may start collapsing them to try to get a better picture, but you may collapse too far. So, it was a couple of conversations and best practice but we were not heavily, heavily involved.

Ellen Hansen – Marketplace Manager - Cigna

What is interesting for next year...it was launched for 2016 open enrollment and one of the changes they are talking about for 2017 is adding some NPI validation and so I was wondering if they were working with you all to do something like that or how they were going to accomplish that?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

So, there are a lot of groups within CMS, I think right now CMS has maybe 180 different systems and they are all doing a lot of different work. Anybody who does NPI validation does work with us. So, I would need to check with my team to make sure.

Linda Van Horn, MBA – President and Chief Executive Officer – iShare Medical

Hi, it's Linda Van Horn, iShare Medical, so my question has to do with parts and subparts of organizations. Is there any thought to putting that hierarchy in NPPES tables?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

Yes, we are absolutely going to be putting more information regarding parts and subparts into the NPPES record when you are starting to register for an NPI as well as the display of that information.

Linda Van Horn, MBA – President and Chief Executive Officer – iShare Medical

And then as a follow-up for that is there any thought to putting together affiliated NPIs for example providers that are on staff at hospitals?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

So, the only type of affiliation reference that we are talking about doing is looking for ways to start tying group NPIs together because we don't release the Tax ID number but there are a lot of NPIs, as I said, that it could be linked to a single organization. So, we want to start making that information a little bit more transparent but we are not really looking toward identifying all of the affiliations that an individual provider has. We have done that through other datasets that were released.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

We have an online question here from Zixing Liu, who asks, how can NPPES address the problem that one provider has multiple practice locations?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

So, as part of the updates that we are making later this year we are going to add the ability for providers to add in multiple practice locations and define which one they want as their primary. I think that was the question.

Andrew Kobylinski – Head of Platform - BetterDoctor, Inc.

Hi, this is Andrew from BetterDoctor, since so many consumer websites use NPPES as a doctor directory and the data is so inaccurate is there some way that we could contribute a known list of incorrect information to you to flag at least in the interim?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

I will freely open up my e-mail address to any recommendations that you guys have. I mean, if there are people that...if you have information that you have found and you say "hey, you know, we're concerned about this" then please let me know.

I think that when we start looking at the fact that we have 4.6 million records it is a lot of information to try to maintain and for us it is about trying to figure out how to build processes to start improving that data across the board.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

One quick question for me if you don't mind, one of the things that I am not sure that everybody here in the room completely understands...that impacts some of the answers to questions you are doing maybe you want to talk a little bit about that and maybe more importantly how people here in the room that are doing provider directory work can work with CMS over the course of this year while you are thinking about how you deal with some of the inputs that might end up happening next year?

Richard Gilbert – Director, Division of Enrollment Systems – Centers for Medicare & Medicaid Services

Sure. So, NPPES is governed largely by the NPI Final Rule which does put in place some constraints about the type of information that we can take. Also, because it is an official system of record we have to work with the providers and it has to be validated by the provider.

So, when for example, somebody says “hey, you know what I have a great product, we’re updating information” even if it is a state to say “hey, I have a system, we’re doing a lot of great work, we’re getting good information, can we feed that into NPPES?” Our challenge is working and setting up a trust between that individual provider and that entity that is giving us the information.

The surrogacy or delegated relationship that we are launching later this year builds on the model that is used for EHR and PECOS today. So, those people that are specifically authorized by the provider can come in and maintain the information but others are not. So, that goes to that sort of right API that we are talking about in the future of how to get there.

As far as how to coordinate with us you can reach out to me directly. I am happy to have conversations about NPPES. There is a lot of other things that we are working on that I cannot talk about, so please don’t reach out to me for those. Please, please don’t reach out to me for those, my phone doesn’t stop ringing, but if you want to talk about NPPES and what you think we should be considering for NPPES reach out to myself and we will certainly set up a conversation.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Good, our next three presenters we are going to go back and look at past meetings and initiatives, we are going to do this as briefly as possible. We left only an hour and that is in large part so we can remind ourselves how we got to this place and to not repeat history. Our first presenter is going to be presenting remotely, it is Micky Tripathi. Micky I’m going to unmute you, hopefully, we don’t get any wild feedback here, if we do I’ll just mute you again. So, Micky are you there on the line?

Micky Tripathi, PhD – President & Chief Executive Officer – Massachusetts eHealth Collaborative

Yes, I’m here, can you hear me?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

We can hear you fine and I will now give you presenter rights and you are now a presenter so you should be able to share your screen.

Micky Tripathi, PhD – President & Chief Executive Officer – Massachusetts eHealth Collaborative

Okay, can you see it?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Yes we can.

Micky Tripathi, PhD – President & Chief Executive Officer – Massachusetts eHealth Collaborative

Okay, great. Well, thank you everyone, sorry I can't be down there in person it sounds like a great provider directory party going on. So, what I was asked to do is just give a little bit of a brief history of the Federal Advisory Committee activity related to provider directories and in particular focused on the workgroup that I chair, the Information Exchange Workgroup, we did a bunch of work now five or six years ago actually on provider directories and have I guess sort of revisited it from time-to-time since then but I think Dan and Rim thought it would be sort of some useful perspective to sort of think about a little bit of that past work and I think it does sort of inform a little bit of the context of many things we have been thinking about and in some ways it is kind of a straight path to the previous presentation that we just heard, which I was sort of delighted to hear the progress that is being made on making NPPES data in particular available through RESTful APIs.

But let me go into this now, so as it says it is a selected and short history of ONC FACA PD activities and history if what historians say it is so this is Micky Tripathi's version of history being the historian who has the floor right now.

So, going back to September 2010 is when the Information Exchange Workgroup that I chair was first asked to start to look at the provider directories issue and the impetus for that was, you may recall for those of you who were actively engaged in this space back then, we had 56 states and territories that had been given money for the statewide HIE programs and we also had the Beacon communities which had been just awarded and were starting to get ramped up as well, as well as all the regular market activity that was going on.

Interestingly, the Direct Project really was just a gleam in Arien Malec and David McCallie's eyes at that point and Wes Rishel's eyes at that point so it really sort of was not on our radar at that time in terms of sort of provider directory requirements but it was really...the question I think came from sort of the growing demand from the various statewide HIE and Beacon community initiatives around the country that were funded with federal dollars and the hope that maybe there was something that we could do from the federal perspective that might provide a little bit of direction and guidance and perhaps catalyze a little bit of standards development and unification around some of those efforts.

So, in November 2010 we made some recommendations to the HIT Policy Committee which were approved from November 2010 to March 2011. I should say that within the Information Exchange Workgroup we set up a Task Force that was focused specifically on the provider directory and it was chaired by Jonah Frohlich and Walter Suarez who many of you may know. Jonah is now at Manatt and Walter I think is still at Kaiser. They co-chaired that Task Force and the Task Force had a number of people on it, I was on it, Judy Faulkner from EPIC was on it and David Goetz I think was on it, there were a number of people, all of whom had sort of various perspectives provider, vendor, payer, a bunch of different perspectives on that Task Force.

So, as we started to get into the discussion we had a number of hearings, we had three or four days of public hearings on it. We quickly sort of moved to the idea of separating the notion of entity level versus individual level and that was not sort of a technical consideration or some sort of high-level theoretical construct it was really with an eye toward sort of policy and again this is the HIT Policy Committee we are talking about not the Standards Committee.

So, the idea here from the policy perspective is to provide policy inputs to the Standards Committee which would then take up the question of what sorts of standards might be needed or might be available to facilitate the policy direction that is provided by the HIT Policy Committee. So, we were looking it at from the policy side and the conversation as we were thinking about provider directories quickly turned to this distinction between entity level and individual level where the notion was that one could imagine the federal government playing a role in standardizing an entity level provider directory where entity, as the name applies, is about a legal entity and as we know there are a lot of variation out in the market but the idea was that there is a legal entity, a clinical entity or a payer entity, some type of entity that has certain attributes related to the type of organization it is, what sorts of electronic end-points it has and as you know some entities are very large entities they just have one, some entities are legal entities and they have multiple end-points and it also may depend on the type of integration pattern you are talking about.

But the idea was that if we are going to try to standardize anything at a federal level that it ought to be at the entity level and that the individual level provider directories ought to be thought of as highly individualized, perhaps at the state level, now remember we were talking about supporting the state level HIE activities and the Beacon community activities so the notion was that at a state level or at a regional level that the organization that was sort of taking on this activity for a particular area would have a lot of differences in the types of individual attributes related to the use cases that they wanted to drive with the provider directories.

I was able to listen in on the call this morning and I think we saw a lot from the people who presented from Rhode Island and Oregon, and Rim from California the broad diversity of use cases that once you start to get into this you start to think bigger and bigger and as we were doing these hearings and listening to the different organizations that were out there it just sort of struck everyone that it would not be a practical or a useful thing to start to think about the hundreds and hundreds of individual attributes that one might think of as the union of the set or all of the sets that everyone wanted across the country but one could imagine that there is an entity level construct that would be useful to everyone and that if we had sort of a standard set of approaches that would be standardized at the entity level, at the federal level that any individual level provider directory activity could link up or synchronize with that according to a certain set of keys as well as security credentials, certificate discovery that kind of thing at the entity level.

So, those were the recommendations that we made to the Policy Committee. In November we made the entity level provider directory recommendations which was approved and then in March 2011 we made the individual level provider directory recommendations and I think Dan provided those in the reference materials and you can see that at the individual level we had sort of a small set of real requirements that we had suggestions about how you might think about an individual level provider directory being able to synchronize with an entity level provider directory and then a whole bunch of best practices that we had

listed and again we were just very conscious of the fact that we were a Federal Advisory Committee of the HIT Policy Committee so we needed to sort of be judicious in the way we tried to sort of think about where the federal government could be useful and helpful and where it would just be way too complex to try to do that from Washington.

So, following on that, the ONC provider directory boot camp followed very quickly on the heels of our recommendation to the Policy Committee. I do not remember being there but Dan helpful produced an agenda that showed that I actually was there and indeed I presented there, so I guess I was there. We did present the recommendations from the Workgroup and also Wisconsin who may know and maybe there also had a lot of provider directory activity that they were doing through the Wisconsin Medical Society and they presented which gave a real flavor to sort of the broad heterogeneity out in the market and the way people were approaching provider directories and also the different angles they had on it where in some places it was the state government in others, like in Wisconsin, the medical society had been doing this for a few years even before Meaningful Use I think so they already had a head start and had a different way of thinking about it.

Then in May 2011 the provider directories work started to begin in the S&I Framework where the use case development for the provider directories to support the Direct Project which started in May. As I said, because of sort of the infancy of the Direct Project that was not even in our scope when we started our provider directory work and indeed even by the time we made our recommendations we really did not have the Direct Project specifically in mind as we were thinking about it. As we know, as that has unfolded, and I think David Kibbe is there and can certainly speak to this, the need...that has been a real source of demand for provider directories and for some type of federated approach to provider directories.

In the Fall of 2011 the HIT Standards Committee took up the recommendations that we made working with Walter Suarez who, as I said, was the co-chair on our workgroup, on the Policy Committee side. He was also the Co-Chair of the Privacy and Security Workgroup on the Standards Committee side. So, he took up the recommendations that we made further refined them and developed them for the Standards Committee but the Standards Committee decided that there were not sufficient standards to really sort of go further with the Policy Committee recommendations.

So, for all intense purposes the recommendations died at that point. We had sort of the concept, we had made recommendations to the Standards Committee that they should identify or think about how we might be able to get maturation of standards to do this and the call of the Standards Committee at the time was there is just nothing that is nearly mature enough to be able to go down this path. So, it sort of effectively died at that point.

In March 2012 the National Coordinator's Office provider directory community of practice on provider directories put out a guide on field practices on how to populate provider directories, again, I think that is in the reference material that Dan provided which had reached out to a number of places like Florida, Rhode Island and had tried to sort of document some of the nitty-gritty issues that were arising as organizations tried to do this without a set of standards and without a unifying approach.

In May 2012 the Audacious Inquiry, I think under contract from ONC, produced a provider directory opportunities analysis that again is there in the reference materials. What that did was it did sort of a scan of the landscape and came up with a set of recommendations that really just said there is some alignment work that can be done here but they did not sort of come out with a strong recommendation on what to do about the provider directories sort of question at that point based on the heterogeneity out in the market and sort of the lack of levers at the federal government to be able to do something substantial.

In April the Information Exchange Workgroup came back into sort of the conversation when we were asked to look at...again some of you may remember there was an RFI that was jointly put out by ONC and CMS about what actions the federal government could take to help to sort of catalyze interoperability and so there was an RFI that was put out to the public and then the HIT Policy Committee asked us, the Information Exchange Workgroup, to think about the question as well.

So, we essentially responded to the RFI and came up with a bunch of recommendations that we presented to the Policy Committee and one of them is directly related to the prior presentation we had here where we recommended that CMS essentially apply open data principles to making NPES Meaningful Use NPI databases available to allow private sector development of provider directories. So, there was sort of two principles there that we wanted to invoke and that the Policy Committee approved, one was opening up the data so that it was available in some type of usable format to industry to be able to start using that data to supplement or to feed whatever provider directory activity that they might have going on locally.

But the second, which we thought was an equally important point, was applying sort of an open data concept which, again, I'm really delighted to hear that is what CMS seems to be doing. Where the idea was that CMS or ONC, or any other federal agency really should not be focused on developing applications, they should just really be focused on making sure that the data is as high quality as they can make it and thinking about whatever processes to put in place to maintain the highest quality of data but then make the data available through usable formats or APIs so that the private sector can pick it up and run with it. So, that was in April 2013 that we made that recommendation that the Policy Committee approved.

And then sort of the last weigh point that I have here on my little timeline is the ONC interoperability roadmap which has as an action item in it that by 2018 CMS should require that Direct addresses and electronic service information are entered into and maintained in NPES which I think you can see sort of connecting the dots that there is some consistency in those types of recommendations that have been flowing out of the Policy Committee and ended up in ONC policy direction and, again, as we just heard is ending up in CMS implementation which is fantastic.

So, I think I have used up all my time, I hope that provides you with some useful perspective on how we got to where we are and Dan I don't know if you want to do questions now or at the end of the hour? I'm happy to do it any way you want.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Are there any questions for Micky right now?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Dan I have one real quick. Micky you had reached back to 2010 in history to go through some of the events since that time. Do you think that the world has changed since that time? We have a lot of interest here in the room or do you think that a lot of that historical information, the recommendations are still valid and we are just coming around to starting to implement some of that now?

Micky Tripathi, PhD – President & Chief Executive Officer – Massachusetts eHealth Collaborative

Yeah, that's a great question. I think in some ways the world has changed in that market activity has grown dramatically since then and sort of the central role that I think or at least the central focus that we had at the time on state level HIE activities and Beacon communities that is not quite the way the market works now and again it was not as if our perspective was that this is the way the market worked then, but, again we were asked to look at this from the perspective of the federal dollars that were going out to these activities and how we can make sure that those activities are making best use of federal dollars, which is a slightly different twist on the question then what is going to work best overall for the market.

So, I think that there were some useful concepts back there, but I think the market is sufficiently different now that we really ought to be sort of thinking about it in a different way.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thank you, great.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

And thanks for joining us Micky and will we see you tomorrow?

Micky Tripathi, PhD – President & Chief Executive Officer – Massachusetts eHealth Collaborative

I may not be able to make it. I will certainly be there in the webinar but probably not in person.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Excellent. Okay, thank you, again, Micky.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right then moving on, our next speaker is going to be Bob Dieterle. Bob is the CEO of Enable Care and has been a contractor, has been or is a contractor with CMS and FHA. He is going to continue to talk a little bit more with us about some of the past initiatives and the past Workgroups and some of the findings there, some additional lessons that we may be able to draw from that. Go ahead Bob, thanks.

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

...discover and we needed a way to discover digital certificates, okay, the certificate side to Direct. We also at the same time realized we needed something broader. We needed a way to go and discover what we called electronic service information. In other words electronic end-points that were not necessarily

Direct address so we started two separate initiatives. I was involved with both of them as a co-chair of each.

The digital certificate discovery is straight forward, we dealt with this put out an implementation guide in 2011 or late 2011 beginning of 2012, and that really set the standard for how you discover direct certificates either through DNS directly or using the SRV record to find it in LDAP. So, that is history that is what we do today.

Our definition of electronic service information was a little broader, it was all the information necessary to discover and use an electronic end-point and there are a number of you in the audience here who have been involved with this.

So, what we did was we delivered a set of artifacts over a period of about a year that included a minimum dataset and data model, we had 50 or 60 people on most of the calls contributing to this based on their own experience some involved with the SSA, Marty I think was involved with this effort along with Karen Witting from IMB, she was one of the co-chairs, and we did a data model and schema for the provider directory, this was done independently of any IHE standard, this was “what do we need?”

We also designed specific query and response models, what do we need to put in a query to the directory, what should we get back and what should the behaviors be, so depending upon what information I supply it changes the way I think of the response characteristics.

The other thing we did was try to map this to existing “standards.” So we mapped it to the LDAP and X.500 standards. We mapped it to HPD. We mapped it to ASC X12, in this case to the 274 transaction. And in each case we identified gaps and in at least two of those cases we worked with the standards organizations to go and see if we couldn’t resolve the gaps in particular with IHE on HPD which ultimately led to what we called HPD+ which is the current release of HPD.

So, as we looked at the broad dataset and this comes from some of the initial work that we have done, this is like back to the future, this is the work that we did, this is the work that continues to be the core of what we are doing here today. So, it is the information related to an individual, their demographics, okay, their address, their specialties, their telephone numbers. We have a broad list, this is just a summary and then we have a set of response information when we do a query. So, we have digital certificates, electronic service information, etcetera.

If you look at the detail it gets fairly detailed, okay, so we need addresses, we need gender, we need NPIs, etcetera, etcetera. This is all information that can be put into a query, it was important to allow someone to ask, based on what they know and what they know may differ depending upon the use case and the situation.

So, we have a set of organizational information, we have a set of individual information, we have a set of relationship information all three of which you could query on. In other words I could find Smith that is associated with St. Joe’s Hospital in Omaha and he is an Orthopedist. Okay now I have organizational information, individual information and relationship information as part of the query. And the goal is obviously to return effectively the same dataset. So, what we effectively did was we defined the dataset that we need, we look to see which part of it should be available for query and the answer was virtually all of it that was the judgment of the group.

When we looked at ESI, which was a unique beast at the time, we did not have an example for what electronic service information should be. We looked back over the various methods of exchange, we have

examples from ASC X12, we have examples from HL7 and v2 and v3. We have examples in Direct. We have examples now going forward, at the time we didn't have it, in RESTful exchanges.

So, what we did was we said we really need three basic pieces of information. We need to know what method you are using, the integration profile, we need to know what it is you are sending, assuming the exchange method is content neutral, and we need to know security information related to that exchange and then ultimately for everything we have to know an electronic end-point, so the electronic address and we also had the idea that since you can reach many individuals and organizations by more than one method what's the hierarchy of preferred methods? So, those were all pieces we did.

The examples are on the right hand side of the slide. So, an example of sending a C-CDA payload over Direct, now we don't have any security information in here and we do it for a good reason because ultimately the security aspect of what we did didn't make it into HPD+ as part of ESI. So, the examples really focus on the integration profile and the content profile.

We defined set of behaviors so when a directory gets a request what should the behavior be? So, the request can basically say "find an individual" in which case it would need to be specified sufficiently to find an individual. It can find a unique individual, okay, or find an organization, etcetera.

Now, looking at this set of seven here is a more complex approach to it or a simpler approach depending upon how you like spreadsheets. So, for example in the query, let's take the...the labels at top are what provider directory, what are the individual characteristics, what are the organizational characteristics and what are the relationships. Because the idea was you could query a specific provider directory in a federated environment or you could get something returned in a federated environment from a specific directory and you need to know which one it was.

While we didn't address fully the federation problem, we were asked not to, we did have a couple of federation methods that we suggested might be pursued. So, for example here, in the second row down, we have an individual ID, the ID is unique, so the return should be only one individual, okay, nothing else will satisfy the query.

If you go down to the next to the last row you have an ID of an individual and organization, so the return should only be for that individual's relationship with that organization. So, in other words, the ability to have the query very clearly specified the behavior of the response.

Now in some case we have very broad ones where we can basically have any field for a particular organization or individual, or any relationship in which case you start to get some very broad responses coming back from a query.

So, this is some of the work that we had done and it is all available on the S&I Wiki under the provider directory initiative.

Work that needed to be done when we finished, we needed to establish code sets and standards for these various ESI components, which were not done. We have done some of that as part of the FHA work in a paper that was posted.

We needed to provide detailed implementation descriptions, much of that came out of subsequent work, for example the Mod Spec work that was done focusing on HPD. So, ultimately this is a summary of the work that we did back in 2011 to 2012 to initially define "what is this we are thinking of?" Now be careful here, this was focused on a specific use case and this use case was discovery of ESI. It was not

about discovering credentialing information, it was not about care relationships or relationships of a provider to a payer, this was about discovering ESI.

Most of what Micky Tripathi went through was exactly the same thing, okay, that was the effort is, how do I discover electronic service end-points. The presentations we have had here today have been across the board with a number of use cases all the way from what the provider and their relationship to a plan to directories that have only entries for someone that has a Direct address. All valid use cases but all very different. And as we start to deal with this over the next day and a half we are going to ask ourselves what particular use case are we trying to solve because the answer becomes quite different.

So, that's the end of that presentation. Questions?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Why don't you go ahead and we'll take questions after.

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

Do them both?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Yes.

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

Okay. A different hat, and by the way that was done under contract with and actually some volunteer work for ONC and the S&I effort. What we are going to talk about here is some work that was done as part of the Federal Health Architecture Group, most of my participation in this was as a representative of CMS so that was the hat I wore.

M

...hat you are talking about now?

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

No, I am talking from the FHA hat now, but the work was done there, so I also contract with the FHA and provide subject matter expertise for them which is why Gail helped to define the presentation, thank you.

So, the work for the FHA and the FHA the primary interested parties in the FHA for this are the Social Security Administration, CMS, the DoD, the Veterans Administration and the Indian Health Service. We also had, at various points in time, participation from the CDC, the Postal Service and from other interested parties, other interested federal agencies. But the initial set are the ones that spent most of their time helping to define the requirements for healthcare directories.

So, we had an initial charge to focus on architecture, what should the federal agencies, plural, do about provider directory from an architectural stand-point, that got expanded in July of 2015 to include short, mid and long-term solutions that might be adopted and approaches.

So, we did some survey work for the federal agencies to understand what their needs were. We created some findings regarding specific issues such as standardization of ESI and then we did some deployment and I'll say individual data element requirement models.

So, we looked at basically three different architectural models a centralized, a federated and a hybrid model, okay, and in the process of assessing it we looked at a series of issues related to governance, remember these are federal agencies with their own priorities, management and operations, resource required to create it and that is really more people and time to a usable solution, financing and financial implications and then technical considerations.

These are the pictures of models and the thing to note up at the top right-hand corner is we recognized that provider directory does not stand alone it is part of a workflow to be valuable. So, we showed these workflows within each of the agencies that is where the rubber really hits the road. That is where the ability to go and to find an address or find a provider is part of the process within the agencies.

We also showed the fact that there may be just single queries I need to find someone or I need to find an end-point. So, this was a centralized model. This assumed that everything was in one place, it was assured services model, each agency only had their little workflow implementations, not so little in some cases, but workflow implementations.

The thing you will notice on the single colored, light colored provider directory are a series of additions, additional pieces at the bottom, additional pieces on the right. What those were are extensions, okay, in other words, specific requirements that an agency had, for example, for specific providers or specific entries or they needed additional information to satisfy their particular workflow requirements. The SSA, Marty has described some of the requirements they had, okay. The CMS has the same type of a problem, they have specific requirements for the providers, information that is not necessarily part of a core dataset.

You evolve, everyone that has presented here today has described, almost to the person, the need for additional information for a specific use case. That is what these were, these were the use case representations.

When we look at a federated model than this thing is just implemented, whatever this thing is, in each of the agencies, there is nothing centrally at all. Okay, any exchange of information is done through a common interface standard or a common API a way to go and query each of the individual ones, but they maintain whatever it is they maintain, they have whatever extensions they need to satisfy their own unique requirements very much like we are seeing throughout this conversation today and probably will be tomorrow we see unique implementation for Michigan, for Rhode Island. We see unique implementations that have to do with particular use cases like DirectTrust that's really the federated model. We heard Texas's approach to it also.

We looked at a hybrid model with the idea that we have certain common information that we all need, specific information related to a provider or provider organization. We need to have that as validated, if you will, certified information. We all need that and we don't need to create it multiple times, we need to create it one time.

And the idea is we create it in one place, we replicate it to the local environment because they are going to have to add their extensions to it and integrate it into their workflow. So, the hybrid model becomes, if you will, in this model, for the federal agencies, a common repository of provider information and end-points.

So, these are the three broad models. So we took a look at this, we spent a lot of time going through, about 150 different detailed items, which we rolled up into governance, management and operations, level of effort and time, technical and cost.

We graded each one, 1-10, based on our belief on how much value it delivered, okay, and the value proposition depended on which of these topics we were talking about, governance for example, how easy it is to make sure that the things I need as an agency get done.

Okay, if I have a shared model and everything gets put in a priority queue getting my requirement for the next six months done may be quite difficult. So, that is not a high rating for governance. Control by the agency was rated higher.

So, we are going to see that, interestingly enough, the federated model was the highest ranked overall primarily because it gave the most control to each agency and the idea of defining a common method of accessing it solved the “how do I find out what you have” problem.

Okay, so we see the strengths and weaknesses on here that primarily focused around governance and operations. Some of them were focused around the technical implications because if I have a central model I still have to integrate it fully into each of my workflows. So, just because I went central does not get rid of my requirement to do work internally it just goes and changes what I do internally.

So, the recommendation that came out was broadly, let’s start with federation, okay, it is the simplest and easiest and as long as we have a common standard for exchange it solves some of the initial interoperability problems. We should move over midterm to a hybrid approach, there is no reason we should all have to create the same validated dataset. We should create it once and share it.

And then long-term there is a hybrid alternative approach and the point of hybrid alternative was this, there may be some things that we want to move into the shared resource that are not requirements of every agency but make sense to put there. So, it is basically moving more toward the central piece for those things that make sense but maintaining the federation and hybrid model where necessary.

These are agency specific requirements the CDC broadly was focused on gathering information on providers, in this case, primarily for emergency preparedness.

CMS, obviously had its requirements related to Medicare and Medicaid, claims processing, their role in providing an NPI, so NPES, PECOS. The SSA, Marty described their requirements and their 53+ directories.

The VA the only requirement they brought to the table was the need for a directory of everyone inside the VA that had a Direct address. Now the VA obviously has a number of other requirements but that is the one they brought to the table.

So, we did a requirement survey looking at types of elements, meaning, what are these extensions or what are the base set and what are the extensions. So, we looked at things like actions against, credentials, demographics, ESI, extensions, scope, okay, these are all the things we tried to understand how the agency viewed them. Are they currently doing them? Are they short-term needs that they have meaning “I have to have it now or next year.” Is it a midterm, I think we defined that as 1-3 years out? Is it a long-term, beyond 3 years out?

Okay, and this basically shows for each of the agencies that responded, the CDC, CMS, SSA, VA, what they judged as their requirements. So you see some very common ones, demographics, obviously, credentials are important. For those that deliver services you wind up with patient access issues becoming extremely important.

And this is just an enumeration of the datasets that we had. So, CMS has NPES, which has been described, Richard Gilbert did a nice job, and PECOS and then we have the SSA directory which Marty described, some VA internal directories, the one that we focused on was the Direct addresses and then CDC's directory and that is really it other than these are the topics that we believe we need to continue to explore and a couple of things that we completed which have been circulated as part of this summit. Questions?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you, Bob. Are there questions?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

I saw VA on your list and not DoD, I can understand why DoD might be missing for any number of reasons, could you illustrate that?

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

Yes, the only reason DoD is not on this list is they did not respond to the questionnaire.

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Good, so let's say they had responded would you have expected any concerns regarding security and the ability to look at queries and troop readiness and any number of possibilities why they might have a special use case?

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

Well, I think that a large part of what we see is future requirements here and part of the work that was done on the trust framework paper that was actually published, okay, talks to that, the fact that there is a need to go and keep certain providers and certain provider information, and certain electronic end-points limited to a specific population of people that can query against it.

So, a large part of what we are talking about here is for example, incorporating granular security that becomes a big issue for a lot of the federal agencies and if you look at the trust paper that we circulated it gives a very high-level overview of it. The definition of how you would implement it is work that needs to be done.

Gail Kalbfleisch, MA – Director Federal Health Architecture – US Department of Health & Human Services

So, in deference to my friends who are here from DoD, this is Gail from FHA, and I've actually had a conversation with some of the people from DoD on that very question so I feel confident in saying that barring awareness of what the access rights would be and having role-based access there are concerns with who can know what and it would even be...there are concerns even knowing how many of a particular type of a doctor is in a particular location. So there are special concerns but those concerns can be addressed and they are willing to address them. They were kind of busy with some little teeny tiny acquisition at the time that we were doing this. Who knew?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

So I have one more question...

Kimberly Heermann-Do, MHA – Chief, Health Information Exchange, Information Delivery Division – Defense Health Agency

Hi and thank you so much for your question, this is Kim Heermann-Do, I'm from DoD. And on the government side we are looking certainly at this and as we go forward we are going to be looking at our security issues, we are working with our public affairs office, I mean, there are a whole bunch of issues that we need to address. So, hopefully, you will give us a little bit of time while we discover our way ahead and our plan especially with our new acquisition and yes we will keep you posted and of course we will share that information with you as soon as we can. So, thank you.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Are there other questions?

Carl Leitner, PhD – Associate Director – IntraHealth International

Hi, Carl Leitner with IntraHealth, with the CDC and DoD thinking of some of the disaster response abroad is that in scope at all in what you are talking about with provider directories in other countries or linking information?

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

No, we really did not consider it outside of the agency's needs in the US that really was what it was limited to.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Any other questions?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

So, Bob, obviously a lot of work went into this on some of your diagrams you had the FHIR logo and you mentioned FHIR here and E-Jeff and I are sort of operating under a condition to salivate when we hear FHIR but we didn't actually hear you say FHIR. So, what is the FHA level of commitment? Are they ready to go? Have they decided FHIR or FHIR is an option?

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

You are talking about the picture of the fire on there?

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Right, you have the FHIR logo all over your slides.

Robert Dieterle – Chief Executive Officer – EnableCare, LLC

Okay, I forgot to explain that. That picture of FHIR served two different purposes, one it was a firewall to firewall off the particular items but it also represented, for those of us that were looking forward, the use of FHIR and REST to query. So, it actually had two purposes.

Gail Kalbfleisch, MA – Director Federal Health Architecture – US Department of Health & Human Services

So, if I could answer your question, this is Gail from FHA, if you remember back to the briefing from the MITRE folks on the pilot they did do some work using RESTful exchanges and proved that they could do the complex query with FHIR.

As far as your second half, what is FHA's commitment to FHIR in moving forward, I will defer that to everybody else because FHA is the group of federal agencies that are working together and all of them are

working a little bit in FHIR, but remember right now it is just a balloted draft standard. So, FHA officially will not push a draft standard.

Jeff Livesay – Associate Director – Michigan Health Information Network Shared Services

Thank you.

Gail Kalbfleisch, MA – Director Federal Health Architecture – US Department of Health & Human Services

You are welcome.

Robert Cothren, PhD, MS, SB – Executive Director – A Cuning Plan, California Association of Health Information Exchanges

All right, we need to move onto our last presentation before the break. It is going to be John Donnelly. John is coming to us as a Technical Advisor to the Interoperability Workgroup and to ConCert on HIMSS.

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

Good afternoon everyone and I'm going to try to be as concise and efficient as I can being just ahead of the break. A show of hands, who has heard of the EHR HIE Interoperability Workgroup? Okay, excellent, so I won't spend a lot of time on the first couple of slides but we just heard a couple of initiatives that were from the governmental side. I would suggest that this is, and has been, the largest private sector driven multi-entity initiative for interoperability. This was not about provider directories, provider directory was considered to be an integral component of one specification that this group was interested in.

You can see on here a number of states that have been involved. So, it was an MOU-based collaboration that had participant members from the states who were the customers of solutions for health information technology as well as the vendor community and the vendor community from two flavors.

Now we have seen also some other presentations maybe from some of the members here that they started here and we are happy to say that I think some of this work that we did in this group kick started some of those conversations and they were very active participants in trying to move forward with interoperability.

The components of the EHR HIE Interoperability Workgroup was not just, okay, let's stand up a provider directory, it was intended to promote interoperability in two flavors we called it, let's look at the second and third one here, the send/receive patient record exchange, so that is "push" right, so that's Direct. And the other one was the patient data inquiry so that's the "pull" so the query retrieve model.

We of course also had a content component which, back in the day, this started back in late 2011/2012 what was out there for content was the C32 that came up from the early HITSP work which we then brought forward into what, in the interim, called something called a bridge C32 which was somewhere between the C32 and C-CDA, and later landed on the last standard that we had available to us as the group was working and that was basically the C-CDA v1.1. So, that is three threads that the group was focused on.

So, today we are going to just talk about the middle one because provider directory was considered to be a critical component of the direct solution that we would want to facilitate and promote and we saw that as a gap in what was coming out of the certification process from the government.

So, here is our overall ecosystem graph and you can see that we split the interoperability challenge into three basic building blocks, the first one was, let's go to the Direct as the last one here, but we have communities that need to exchange via the query/retrieve type model and we see that they have a need for interacting with their members from their EHR systems into an HIE kind of environment, HIO kind of environment, so they have an intra-need that needs to be addressed in terms of interoperability.

They also have an inter-exchange requirement, which is out of a gateway kind of thing and as you might imagine we have done a lot of harmonization work with Eric Heflin and the eHealth Exchange or at that time it was NWHIN and then Healthway, etcetera, and we have stayed in touch over the years to stay aligned there. So, we did not intrude but we wanted to collaborate on being able to stand up something that was both cross community and intra-community.

But the other one was the Direct one and we felt that there was also a need to enable a send/receive model and inside of that space we had Direct, which as you all know, had two flavors of exchanging, right, one was the SMTP model and the other one was the XDR one that came out of IHE that would talk to a HISP of some flavor and we saw that there was a need for a provider directory in that space. So, the use case for us was pretty simple, it was exactly what Bob was just talking about, it is basically ESI, it was basically to get the Direct address. That was really the sole use case that we saw at this time that we needed to be concerned with.

So, we felt that what were we going to do with provider directory, this is not a standard's body, this is not anybody that can say "we are requiring everyone to do this" so we had to get collaboration almost by volunteerism to support what we were doing.

So, of course, what we wanted to do with the provider directory topic was to look and see who else was talking about it. You heard earlier that the ONC had done some work with the provider directory and just about around this time the Mod Spec Group had done work with the ONC and I had the pleasure of working with both John Rancourt and Matt Rahn and tried to say "okay, what do we do, how can we leverage this" because even though we were a private sector we needed to stay aligned with the governmental activities in this regard.

So, we landed on the HPD solution and we started to look at "what is the way that we can actually do this." So, you will see this thing is already updated to the federated HPD solution, so to speak, but early on it was not that robust, it was the HPD from IHE with the added additions from the ONC's work, from the Mod Spec Group that enhanced it for USA's needs and extensions that came out of that.

So, what are our considerations here when we looked at provider directory? As I said earlier, it needed to be aligned and built into the general specification for send/receive, right, so that was our critical use case.

We needed to align it and work with the governmental work, the Mod Spec Group was the leading discussion group at that time and we wanted to make sure that we did not go off on a tangent, remember we are a customer of the solution trying to promote it, we are not intending to define our own rules here but to leverage what we can in standards.

And those I think we saw on one of the slides earlier today this infamous CP 601 which was a change proposal to IHE that took HPD and it states back in the early rounds to the HPD+ tier, so this is an actual process that IHE has that any time you wanted to propose changes to an underlying spec you write a change proposal and that still exists and that is the vehicle we did and this was the infamous 601 number that would actually create the collaborative result of the federal government and IHE coming to the same conclusion and coming to the same guidance for the industry. What we did when we initially did our publication, back in the day, was to land on HPD+ as our guidance.

In 2013, and I think you saw a little bit from Micky talking about, okay, INC and the stuff from Bob about the ONC's S&I work, they were starting to wonder what was going on with provider directories in the USA's landscape. So, the Interoperability Workgroup received an award to take a look at the models for querying provider directories to support both EHR to HISP exchange but even more importantly HISP to HISP. They really wanted to know what are the people doing? What are the organizations doing?

And with that we ran four pilot communities, I think I saw Carol Robinson in the room, she was also a part of this helping to do some program management around this, it was across four states, we had 10 different vendors involved and we did basically a pilot data capture around exercising what did they do, how did they do it, how did they handle the query response, what were the responses that came back and just try to get an idea as to what was the interest of one solution over another.

It turns out where we landed was that it confirmed the diversity of solutions. We knew going in that we probably had multiple, well we definitely had multiple, and not only did we have it on paper we had them being operationalized. So, that means that any change that we needed to do would have to come into things that were moving rapidly from a pilot to some flavor of production. So, if we had to do something we had better do it fast.

And so what we said is that it seemed like the gap was that we did not have an easy way on the HISP to HISP to solve that problem and so the first kind of underpinning of our action was to say "we'd better get a federated solution out there and have it be supported by both the government and IHE." And that is what really took that team to work together with IHE and the Interoperability Workgroup was basically serving as a little bit of a facilitator there and I was personally involved with trying to do some of that facilitation and we did, after some iterations, because as you already know IHE is an internationally focused organization so its domains and its profiles initially have an international objective. So we had to decide was this going to be a US domain extension, which is an opportunity we can do within IHE as well or how were we going to handle this.

As it turned out at the end of 2014 a new federated option was baked into the IHE HPD profile which is there now and can be leveraged by organizations that need to implement a federated solution. As we saw earlier this is grounded in HPD. This is HPD as it stands it is a SOAP DSML kind of technical interface and right now as a customer we are here today because what we have done is said "all right, let's see, how do we operationalize what we've said is the standard."

So, around that end of 2014 what we decided to do as a workgroup was to look for some partners. So, the Interoperability Workgroup met with both IHE USA and HIMSS to say "how do we move forward with this, how do we promote the uptake of our standards in the industry?"

And the decision was that we should do it through a collaboration and really drive this to a program that for the most part we would like HIMSS to leverage, use their presence in the industry and to establish this and promote this not just by paper but by actually standing up a conformity assessment testing and a program that actually does some level of certification of products that support this. Out of that and announced in HIMSS 2015 is the ConCert Program. So, that is the ConCert by HIMSS Program it is the result of the three groups there, ICSA is actually our testing lab and our certification body.

Now those that are familiar with the ONC Program for certification it does leverage the same kinds of requirements in terms of accredited testing labs and accredited certification bodies, right, so there is some ISO accreditation that is an underpinning of the program. But the offering is to actually test that model of connectivity that you saw in that big picture.

So, the ones that are now being tested, and we did pilots in 2015 under the ConCert Program, we had seven or eight systems actually pass the pilot certification and you can see that what we did is we took that original EHR Interoperability Workgroup threads of Direct and query/retrieve and we recast them as a set of requirements in a testing product that says “if I am an EHR what do you want me to do” right, because the objective is not so much to worry about the specific capabilities, we are saying, to our customers, to our purchasers, we would like an EHR, one, to be able to do both.

This is not an either/or thing. We would like them to play and do Direct because some use case from a clinical sense make sense for that and others query/retrieve might make sense so, the testing components inside of ConCert for an EHR includes both. It also includes the ability to query a provider directory and get back a response. We grounded it in the HPD that we just talked about and as we started to test the waters with it we did get some feedback from the industry that said a lot of what you are hearing today “we started to do it, we are not seeing a lot of uptake in the industry so I don’t know whether this is something that I really want to move forward with.”

So, I was actually very pleased to hear that this group was reconvening or convening around this topic so that we, as a customer now, the ConCert Program actually now is a customer of the guidance that will come from the standards bodies underneath and we are open to now look at this and say “what tooling, what do we need to do in order to provide some good conformity assessment testing to the solution that we put out here.”

So, it is a little bit of a different spin to what we heard before because we really want to be a private sector conformity assessment resource that you are deployments can use. If we can help create products that are on a shrink wrap basis at least do the things we say here then you can start there with your own onboarding you do not have to go back to the entry level standard support.

You can see the other two programs that the ConCert Program does, those align to the...the HISP is of course the HISP work that does do provider directory and some work there and the HIE has to do with the query/retrieve and we are now talking with the eHealth Exchange again to say “okay, where are you, how do we align the testing program you do with the testing program that ConCert does.” So, all right I’ll stop there and open for questions.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right we’ll take one question because we are running long on time.

Greg Meyer – Director, Distinguished Engineer - Cerner Corporation

Hi, Greg Meyer, Cerner Corporation, one quick question on this with the ConCert Program. Does the ConCert Program do anything in terms of governance or policies, or validation? Because when I look at a lot of these technologies the technology side is really only about 20% of the story that is the easy side of it. The real hard part is going out and then actually getting these connections to start doing and establish a trust via MOU certification or MOU’s Federation Agreements, whatever, does ConCert do any of that or is it specifically technical only?

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

It does not right now. It only does the technical connectivity testing validation. And that is why as we look at organizations that want to use it for the most part I think those are things that might be done more on a local basis. We see for instance, in the case of DirectTrust, DirectTrust has focused exclusively on that, I mean, they have of course a certificate management that they do with their trust bundle but a lot of their accreditation that they are doing with EHNAC is around the other thing of the organizations being

able to securely operate and standup operational policies and procedures. That we do not get involved with ConCert.

Greg Meyer – Director, Distinguished Engineer - Cerner Corporation

So, you...

John Donnelly, MS, MBA, CHIMS – President – InterPro Solutions

I certainly do and I think that is certainly a conversation that we could have with David more on that.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, well, thank you. And I want to thank everybody in the room here you have been holding out very well, it is halfway through the afternoon, it has been a long day already, we have a little bit more coming and so I'm going to ask that everybody hold in there just a little bit longer.

First of all for all of the business and process people we have an exercise we are going to do during this break so there is something for you and for the techies that have been waiting for FHIR all day we have somebody coming back to talk about FHIR later, Jeff smiled when I said that, so during the break this is your opportunity to make sure that what we do tomorrow is relevant to you, okay.

Tomorrow's session is...today we have been talking about and will continue to talk about where we have been and where we are. Tomorrow is about where we need to go, okay. So, one of the things that we are going to be doing tomorrow morning is concentrating on use cases, scope, data, features, etcetera that provider directories need to have and in the afternoon we are going to be talking a little bit about the issues associated with meeting those goals.

So, during today's break I'd like to make sure that people start writing down some of the things that we should be talking about tomorrow morning. Now I think in your agenda it says that we are going to talk about three things tomorrow morning use cases, features and data elements. Dan and I were talking yesterday afternoon and didn't know how to separate use cases and features so we thought in terms of use cases, data elements and scope. During lunch I decided to actually start putting some examples together and I couldn't figure how to do that either.

So, there are two easels up in the room and they are labeled use cases on my left and scope on my right. And to be really honest with you I'm not sure that I care a whole lot where you write your idea. First, when we are talking about use cases don't freak out if you are a systems architect we are not talking about use cases in the classical full blown systems engineer's case, we are just talking about what it is, think about it as user stories use cases, questions to be answered by a directory, etcetera and put them over here. And I put a couple of examples up there and I would encourage people to put things that you aren't sure should be included but want us to think about.

So, for instance I put a couple of things up here we talked already about that a provider need to find the Direct address of another provider, okay, let's make sure that the, we kind of think, we all agree that this needs to be there, but also should consumers be searching provider directories to find a specialist close to them, well, maybe, I don't know and we should be talking about that tomorrow.

Over here what is labeled scope are areas that you believe should be part of the future world, okay, so obvious things, provider demographics, I think we all agree that this needs to be there, now what demographics means it could be a lot of different things, but that probably needs to be there.

I heard Eric say today, that an organization's participation in a trust framework should be in the directory, never occurred to me before. So, maybe we should think about that. Now in filling things out, like I said, I don't know that I care which one you write on. Marty for instance today said that for SSA they need to not only know about what your current information is but they need historical information. So, I don't care whether you write over here historical provider information or you write over here that a government agency needs or a payer needs to find the provider information on July 17th of last year, but make sure that the idea gets up here so that we know what we are going to be talking about.

This isn't your only opportunity to write but it is your first one. We are going to do this between now and 3:30 when this break ends. We have a little time in this room at the end of today's session it is time to write more ideas then so don't freak out if you don't get to an easel today, excuse me, during this next 20 minutes.

We also are going to have time tomorrow morning before we do things so as you are thinking tonight and/or having dinner with your colleagues and new ideas come up that is another opportunity, but I would encourage people to start putting things up now because it is going to get other people in the room to start thinking about things. Dan is there anything else we want to pass onto people before we break?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Just real quickly there is some more coffee for those of you who might need to be caffeinated and if you step outside you do need to leave this badge here and I think probably if you leave this badge here you might want to have your driver's license or some form of identification in your pocket. You just cannot walk out of the building with this tag and then get back in. And when you leave again today also leave this here you will get it back tomorrow. That's it.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right, thanks, Dan, 19 minutes, please be back and ready to get started again at 3:30.

Break

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All right folks, home stretch now. So, first of all I want to thank everybody that wrote on the pad, people did put some things up and you did manage to put more up from the room here than we got over the phone, just only barely, so you should feel a little bit guilty about that but there was some good conversation during the break and I'm not going to hold it against anybody. I do appreciate that. Do remember you have two more opportunities to write on these things one of them comes right at the end of the day, so before you run out jot that good idea you have down because it will disappear tonight at dinner I'm sure.

All right we have a few more discussions today. Before we get started with that there is a pair of sunglasses that I'm carrying around with me somebody left on a chair and it has been floating around the room, if these are your come grab me and explain your sunglasses, I don't want them so...and I don't think they will get much on eBay so you might as well go ahead and claim them.

Our next discussion is coming back to Eric. Eric is going to talk to us a little bit about HPD as a standard, since I blew it before with his organizational affiliation I'm not even going to try this time. Eric wears so many hats so I'll let him go ahead and do that. Dan do you have something before we get started?

Dan Chaput – Public Health Analyst – Office of the National Coordinator for Health Information Technology

Yes, before Eric starts just a reminder to virtual participants there is a separate Go To Webinar registration for tomorrow. So, there are two separate webinars.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

And also if you are here in the room today but plan on attending virtually tomorrow you do need to register virtually is that right Dan? Today's registration won't cut it make sure that you register for tomorrow's session if you can't be here tomorrow.

M

...public-facing website.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Okay.

M

If people don't know where that is stop by...

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

All, right, thank you. Eric?

Eric Heflin – Chief Technology Officer – Sequoia Project/HIETexas

Very good, thank you. So, thank you very much it has really been an honor to be here and to be asked to share lessons learned. I really view this as a responsibility, I feel like we really, those that are implementing, those that are involved in standards really have a responsibility to share both positive and negative things.

My goal today in sharing a bunch of negative stuff, which is probably 2/3 of the slides here, is to basically provide something to build on. I think we have as much value to offer each other by sharing what did not work and what is not going well and what is controversial as we do by sharing what actually is working quite well as well too.

So, I am going to be focusing on both positive and negative lessons learned on really production use as well as use from a perspective of a standards body author.

So, today or for the next few minutes I'm going to talk about really our use cases just for a second...earlier it is mostly for completeness for those that look at the slide in isolation. I'll talk about the eHealth Exchange's directory which has been live now for many years, what is working well and what's a problem.

Also talking about healthcare provider directory lessons learned in the trenches from the standards body perspective, and I think Rim and others can talk better from the actual production use perspective than I and I encourage you to reach out to them to Michigan and others as well too that are in production today with HPD.

I will talk about current activities, to me this is where we start talking about the future instead of the past. This is what is going on right now and the great thing is things are just ramping up and now is a great

time to get involved and to make sure that your organizations needs are being met and I've got some specific directions on how to approach that if you have a need for that.

And then talking about just my personal recommendations what I think we should do from this point forward and then some references for those wanting more information.

So, the use cases, I talked about this last time I was up here, so just to quickly list them, searching by people or for people, or by organizations by attributes of which those should be defined such as language spoken, the ability to support a given use case and so on, the ability to search based on relationships, that's a key thing and a subtle thing that I think is lost for a lot of initial implementers of directories, it is not just about the data and the individual entities it is also about the relationships of the entities to each other such as parent/child relationships or organizations perhaps even human parent/child relationships.

Keeping a list current is within scope. I think it has become pretty clear both today as well as a few weeks leading up to this. I was surprised by that I actually expected that to be out of scope, I'm pleased though it seems to be in scope because that's a challenge that we should address proactively rather than reactively.

Also the ability to retrieve objects from a directory, the ability to determine FHIR, SOAP, RESTful, Direct e-mail whatever any kind of electronic service end-point for any kind of exchange and even I think in the future, and hopefully the near future, that includes things like pub/sub so we can actually subscribe to a list of services based on an end-point and manage that description over time.

For example, I at the CDC want information about all patients admitted to the ED with influenza-like illness, that was actually piloted a few years ago, I think that is an intriguing pilot that provides potentially a weather map for example for illness forecasting.

And then targeted consent expressions and then, thanks to our friends in Michigan also, including consumers within this directory as well too, enabling things like encounter alerts.

So, the eHealth Exchange you may not be aware of this but actually we have had an exchange, a directory, since before really we went into trial implementation to use. The very first eHealth Exchange back with the Social Security Administration and MedVirginia both of those entries were actually in a directory at that point in time.

Today we have 120 participants live in our directory, I think actually about 130 of about 120 or so have declared that they are live in production, represents over 100 million patients, we are shooting for half the country by the end of this year live in production. So, I won't talk too much about the exchange I think you are all probably relatively familiar with that.

But what is maybe not familiar to you is that the directory has been in production for 9 years so we actually have a lot of experience managing a directory that crosses federal agencies, states, private MDs such as IDNs and others as well too.

Our current directory was based on the UDDI 3.02 standard. I actually personally voted for that and helped write that spec but I was opposed to it even back then, I just didn't know of a better solution and I think we are converging today now on some better solutions which is exciting to me.

The structure of our directory, I debated about showing you some XML but that's available e-mail me if you want to see some, but actually it is organized quite logically, it is organized into three classes of objects within the UDDI, the highest level is a list of business services or sorry business entities such as the Social Security Administration, HIETexas pick your organization and that has metadata there such as

the organizations contacts for business and technical information. It also has information about their geographies, zip or states they cover for example that's a big list for some of the federal agencies such as just all states, but for many of us it is smaller just like the State of Texas or various states, or various multi-states, regions.

Then below that it has metadata such as the services and below that it has end-points. So it is a logical hierarchy and this does make sense from a perspective and probably back in the day when this was created, we are talking 10 years ago at this point, it made a lot of sense because for example you may want to have a service offering that is different than the technical implementation of that service. So, for example you may want to have the ability to push data and then below that you may want to have multiple ways to receive it such as FHIR or REST, or IHE profiles and so on.

So, the primary use case with eHealth Exchange directory is electronic services end-point discovery, that is what it is called now, we did not even name it back then but that is what it was called or is called today. Typically a query of our directory is organized by geography such as give me all the entities that I can exchange data in the Carolinas or in California, or within certain multi-state regions.

The other common queries are to query based on a version of service supported. We have two versions of our standards or really specifications to be accurate, in production use today and we supply that information in our directory therefore version control is implemented in the directory and that is one subtle thing that is very important.

If you actually have not read it there is a really good book out there I read about two years ago I think it is titled APIs as a Business Strategy or something very similar to that and it is a great book because that is basically what the eHealth Exchange is an API so is Carequality with governance and legal framework on top of that to make that API work in a business/legal context. But the book actually talks about managing APIs such as the ones maintained by the large vendors out there including publishers of information and services.

So, the version control is one of the issues that book talks about that actually should be baked in our strategy so I always kind of wince when I look at directory definitions and versioning is nowhere in there, there is no field to talk about what version of the service is under description here because I think that is a fatal flaw and we need to address that for any directories we stand up together.

Another common search is by the name of the organization and then finally a list of all organizations and I think it is actually the most common use of the eHealth Exchange directory today is to just enumerate it. You give me all exchange participants and I'll take the data back, I'll apply my business rules based on my EMR or my HIE's capabilities and then I'll incorporate that filtered list into my system for example I'll only bring in exchange partners to support maybe the care summary use case kind of a use case and that is actually one of the gaps I'll talk about here in a minute in as well.

So, things that are working well, the directory is actually in production, it is working. I mean, I don't think it is ideal, no one is claiming that it is ideal, but it is working. It is in production. We have people using it every day. It is used widely. I would guesstimate 75% of the exchange members actually hit this at least once a day. We update the directory about three times a day on average even for our little directory is 120 or so entries, it is still quite dynamic and so it is untenable to maintaining this information other than through automation or an automation processes.

There are many, many use cases that were incorporated in the use of provider directory, for example encounter alerts that may not be immediately obvious but I don't know how to do encounter alerts without some type of provider directory. Consent, we can do consent without a provider directory but I

think it falls apart and becomes non-scalable because then you are always having conversations, who is this doctor, who is this facility, who is this state, who is this HIE...but who is this HIE you are actually talking about and expressing preference with respect to. With a provider directory that can be unambiguous.

Okay, so let's get into some negative lessons learned. Again, this is just really to hopefully share some information that we learned with you to help you basically build on top of this. And I am committed to making sure that anything we are involved with at least the people are aware of these limitations and so either we accept them or we try to solve them.

One is that it certainly is, everything is about the data so one step the exchange does, and I personally do and my staff certainly does, is every single directory entry that comes in for a new directory for an update we QA manually and every time we see a problem that looks like it is codeable we actually program a new business rule into our custom written tool that basically automatically parses directory and kicks it back out saying "you shouldn't have a colon here" or "you need to actually provide a port number" or "your FQDN is missing for your service end-point address" whatever the case may be.

So every time we come across a rule in terms of quality assurance that can be automated we do and that has provided a lot of benefits.

Most recently we had a staff change, our former program manager actually is now an Air Force Cybersecurity Officer, so we actually have new staff taking over the provider directory maintenance and so by the fact that we automated a ton of these quality assurance rules that new staff member was able to pick up and actually have the benefit of all that knowledge really encoded into a reproducible automated process.

And then one thing I think the exchange shows is that national scale provider directory it works, it is in production, it is viable and we can build on it and largely it is working with only the problems we see today.

Automation, besides that being essential for scalability it is also essential for quality assurance, it is essential also for independence of the technology because even though I am a technologist, as I mentioned earlier, I still think business needs to drive this and so our tooling I just mentioned is actually designed to be technology neutral as much as possible.

We expect to have a sunset period where we switch from our current implementation of UDDI to something else, well during that intermediate period we want to give our valued stakeholders plenty of chance to do version upgrades, give vendors plenty of chance to do version upgrades with their product as well too and deploy that in the field, so probably maintain both directories for a period of time maybe months, most likely years and so our tooling is designed actually to facilitate this so we make one entry into basically kind of a master source of truth file and that is propagated into multiple directories allowing, again, for efficient operation even though we would maintain potentially two directories for a while.

Also, we have identified a number of additional gaps in our directory. We have published a draft specification that is freely available, feel free to Google it or shoot me an e-mail if you have any interest in this I'd be glad to share it with you, but we have actually written down all of the gaps in our current directory that we feel exist and have a plan for solving all the ones we can that are viable to solve.

So, some of the gaps for example are today, let's say Texas want to exchange with John Donnelly's state, New Jersey is that where you play? Okay, so or Pennsylvania I forget which one it is these days...

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Eric Heflin – Chief Technology Officer – Sequoia Project/HIETexas

New Jersey, okay. So, let's say New Jersey and Texas want to exchange, so basically I have to pick up the phone and talk to someone in John's staff and say, what's your test patient name, what are your end-points, do you mind if I exchange with you, are you actually live, are you still building out your services, what use cases do you support, what kind of content will you accept, what kind of context will you produce for the SAML attributes of the purpose of exchange, what are you going to send me, here is what I am going to send you, will you accept these in terms of your access control engine and then what roles within your organization are going to send messages to me, are they going to be doctors, are they going to be marketers because I'd probably have a different result in my policy engine or my data source policy engines depending on the result and outcome. Right now every one of those is a manual conversation that's got to change.

So, we have actually created a new specification for basically an enhanced version of our current UDDI that basically addresses every one of those issues plus more as well too including things like content formats and detailed content formats. So, that basically everything I just talked about including test patient identifications and so on can be automated.

So, in the future our hope is to have...we are shooting for zero manual process onboarding or zero configuration, or auto configuration so that when a participant joins the eHealth Exchange they basically have enough information within the directory, they do not have to have a person picking up the phone to talk to someone else actually to get all this information like they do today.

Now as far as timing, we published this last year, we got great feedback, we are basically ready to move forward with it but as far as timing the reason we haven't is because we wanted to do this not alone. So, basically what we are trying to do is take these requirements all to the Argonauts and also to IHE USA National Extension to basically try to make that what we do is actually compatible with as many people as possible and once that process finishes up then we will run with whatever the outcome of that is.

For any techies in the room this is actually a diagram showing you what HPD actually looks like so there is actually, on the left-hand side, a consumer actor, this is the person or system that is requesting information and on the right-hand side there are actually two flavors or actually in middle there are two flavors here, on the bottom you see basically kind of a standard monolithic centralized architecture directory. So, here is a source of information, all the directory information is here directly that could be incorporated by batch file, it could be incorporated through automation, it could be basically just a single directory for a single entity. So, if the requestor requests information that entity in item 3D there, this returns a response directly.

What is more interesting though, and some of my organizations use cases require this capability or something similar to this, is on the top there in the middle you see that is actually what a federated directory looks like. So, here the directory indicated by the blue actually is also attached to consumer because when this directory receives a request from the consumer on the left-hand side it takes that request, maybe it does a local directory lookup but also it rebroadcasts that all the entities on the right-hand side in real-time aggregate results and sends it back to the original requestor and that is important for a number of business reasons that I think we have already talked about earlier such as the ability to have a state directory that points to other regional directories or a national directory that points to other state directories where the data lives closest as possible to the entities being managed.

This is just a quick slide showing the structure of an HPD or an organization, so this is a non-person entity, so we have the structure of the organization, we have specialty information, credentials, identifiers, zero more addresses and then we have relationships to other organizations. And this is just obviously a short version there is actually quite a few attributes here that I am not showing.

For a human provider it is somewhat similar. We have identifiers zero more, that's great by the zero more because it means if you have multiple values such as NPI number, a DEA number, a board licensing number, etcetera you can actually reflect all those in here and you can actually indicate where that number came from. So you can indicate it is a board licensing number assigning authority and here is that person's state board licensing number. The same thing for credentials, same thing for specialty wherever possible these are value setted but they are not value setted in all cases.

And then here we have relationships to other organizations. Note what is missing though there is no relationship today between people and people. There is a relationship to a person and organization, if I go back one slide, right here you see there is a relationship between organization and organization so it is not parallel implementation and that is actually where kind of the Michigan use case where they have the need to represent consumers also may drive requirements and that is where it is really an interoperability issue, it is not just a deployment issue because the data model would be different in this case.

So, context, we talked about federation may be required and I have heard that this is maybe a deployment issue not an interoperability issue. I would love to debate that with anybody that feels differently but I claim it is an interoperability issue and the reason is because the data is different at the services level so it has to be in the spec I assert in order to implement federation, but I do think it should be optional though or pub/sub could be done under something similar as well too.

Participation just one fact here that I was disheartened in, because I was one of the authors of HPD, not the key author but I was one of the authoring team, in 2015 we had around 18 organizations, about 20 or so testing it, last year we only about half that testing in a connect-a-thon and I've done a survey, which I will talk about more in a second, as to why and many said they are waiting for the Argonauts and the Argonauts actually have started basically last week, with Brett helping to lead that and Micky Tripathi as well leading that effort, to work on provider directories.

This has been deployed pretty widely, I'm just looking at the clock here, so I did a survey, there is the date and time, asking whether or not people thought HPD was ready for market adoption, half said "yes" half said "no." Of the ones that said "no" they said they want either a FHIR-based directory or they wanted to fix the current HPD.

And so I went to the IHE USA Board of Directors in December of last year and I proposed to them and they approved me leading an effort to create a USA National Extension for HPD where we have been meeting actually up until HIMSS and we are going to start meeting again soon to basically create a version that is more specific for the United States, it represents the Mod Spec lessons learned as well as things we have been talking about this morning and things we really ought to be talking about that we have not yet.

Also, half basically did not like LDAP, they did not like the LDAP origin, the query syntax, the requirements, the data structure, the chattiness and so on. One thing I want to note too is that FHIR actually may suffer some of these as well too so we just need to go into this with our eyes open.

Some more lessons learned. Some implementers thought that federation was required, it is not, it is optional. Many thought LDAP was problematic. Others thought, and I agree with this one, the syntax in HPD for an address is kind of silly, it basically is a name, value pair within a name value pair that is hard

to parse, that is hard to make efficient, it is hard to index and ISO has a better standard that I am proposing we adopt this as part of the USA National Extension and fix HPD to also address this.

Finally, others felt HPD was chatty and I agree, I think you have to take all the requests but I also fear if we are not careful FHIR might have the exact same outcome. We already talked about that.

Positive lessons learned, LDAP gives you a lot of value, you may not like it, I may not like it, but it does give you a lot including an interchange data file format for free as part of the standard. Relationships are intrinsic and then I want to re-emphasize I think use cases must drive the design.

Last year the ONC helped quite a bit, they actually brought Dragon, Nagesh, to the table who created HPD in terms of test cases and so on, and that was an extremely valuable thing that the ONC did and I think it provided a real service to the industry to help us get this point probably a year or two sooner than we would have on our own. So, one of my recommendations is for the ONC to continue to do that if possible so that they could be at the table and actually defend a resource to help a system develop estimates.

Current work, I am working on a USA National Extension along with actually three or four people in the room and would love to have more and more people involved, I would love to have you co-lead it or lead it, I'd be glad to step aside and let someone else take leadership of this but I did not see anybody else doing it so I stepped in but I would love to have help on that, nothing magical about my involvement in that.

Also, in addition to USA National Extension there are the Argonauts have identified last year that this is one of four top priorities, however, they only kind of really got to three and this is their fourth but Micky and team have been kind enough to pick this up and they have actually now brought in some heavy help, some heavy guns, big guns to really help on this including Brett and Josh Mandel, and Grahame and others are actually helping on this.

So, we started last week in earnest, we actually had two meetings, the use cases I showed you first and this presentation please look at those and let me know if those are right or wrong because those are the use cases I presented to the Argonauts last week saying I think that those are the use cases that should drive the requirements from my perspective, subject to feedback by of course the other Argonauts which are really the main members of this not me.

So, lessons learned, I will probably skip a lot of these I think we have already kind of hit most of them. One thing there in the middle CRUD operations look like they are important, create, read, update, delete operations, read operations are all essential because directories don't exist in isolation so there has to be some type of a way through appropriate security means and access control of keeping directories in sync and up-to-date and current.

Now here is kind of a shocker, on the third bullet from the bottom, to me I did not really realize this going into it, but one thing I'm asserting currently is it is actually absolutely essential that every single element within a directory be interoperable and be value constrained more than even clinical data because every element of the directory is useful for some specific business purpose and if it is not highly constrained it is not going to be interoperable.

So, there have been a few elements in UDDI that are not constrained for example contact type in the eHealth Exchange UDDI, we do not specify the type of the contact just that there is a contact that's a problem, like when organizations try to deploy a list of organizations within their phone book or directories of who to send the eHealth Exchange query to, if they search by the city and the city happens

to be from the contact that is the vendor not the customer and they are on the other coast of the country, which actually that exact thing happened, so we actually have to have value set contact types in the registry, value set addresses, value set relationships and everything.

Okay, we talked about the rest of that. My recommendations, ONC involvement I think is essential to be a convener like they have been today, to be a voice at the table, to provide resources if that works out from a budgetary perspective, having Dragon involved a few years ago and last year was just such a huge assistance for all of us, basically they created use cases, they created a draft spec, they created code a representation we could download and test on both send and receive side of things.

Another recommendation is if you are interested in provider directories and you are not involved with the Argonauts please get involved reach out to your vendor, reach out to Brett over there, Brett raise your hand, reach out to myself as well and we will see what we can do to get you guys to engage with them.

The IHE is also working on this actively so just search for IHE USA National Extension you will hit our home page we are doing everything transparently so everything is white boxed and completely open to everybody.

And then please if you are not involved in SDO please get involved because a lot of the requirements I heard today just really frankly shocked me. People are doing things without knowing that there is a venue for improving the gaps, for example, I think Oregon mentioned today that they want the time a given person was associated with a given organization, well that is an easy fix, we can add two time elements service start and stop time or something similar to that, but no one has ever made that request and I'm on the IHE committee that fields requests like that. So, I have to ask the question...

Recording abruptly stops

So, that is it, thank you, appreciate it and I think we are probably out of time so I will step aside.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thank you, Eric. We do need to move on. Our next speaker absolutely wins the prize for the longest distance, I do not want to hear anybody in here complaining about their commute today, what is it 7:00 a.m. your time tomorrow?

Brian Postlethwaite – Senior Solutions Architect – Telstra Health

Yes 6:00 or 7:00 a.m.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Okay. So, Brian is going to talk to us about FHIR today, thank you Brian.

Brian Postlethwaite – Senior Solutions Architect – Telstra Health

Since it is 6:00 a.m. back home if I start to fall asleep just wake me up it's okay I'll try not to snore.

I am using this stuff in our internal products at work, I am also a Harley rider, so I am just going to...I had a whole lot of other stuff in, I've cut a lot out and I am just going to go in an example use case running through and I'll leave the questions open as to where the provider directories fit into my use case.

And so my scenario is, lucky me, I'm getting a colonoscopy at a hospital. So, first of all I'm going to go and visit my GP and he is going to say, great, before I went and visited I probably had to have an

appointment to go and see him. If I wasn't at home I would have had to go and find out where do I go and find this GP? So, okay...so two nice simple use cases. I went and visited that gastroenterologist, which I needed an appointment for. He prescribed me some medications and tried to get things under control. I went and got those medications, maybe I needed to find out where a chemist was that actually supplied the medications I needed that was covered by my insurance provider because it was some pretty specialized stuff so another use.

I had to get some tests done, that is pretty normal, so I need to go and find out, well, where is the pathology lab that I can go to, went back to my gastroenterologist, I had to go and book the colonoscopy, I had to turn up at the hospital, fill out that lovely clipboard, you wander into the hospital, here is the clipboard, enter in all your data. So, what year is it again? Why don't we just check in on Facebook and see what is going on.

So, admission on hospital, Facebook knows more about me than my...

Recording abruptly ends

But then I was discharged from the hospital and after discharging from the hospital my discharge summary and all of the results that would have happened as a result of that would have gone back to the gastroenterologist and probably my GP as well.

And so I guess each of those steps there probably involved a directory. So, are there any steps there that did not involve a directory of some sort? No I think they all do.

So, they had some aspect of search or lookup. So, do people see a difference between what searching is and what lookup is? So, searching is I don't know who it is but I know what I'm looking for and in one case there I was looking for a pharmacist, I didn't care who the actual pharmacist was that I ended up seeing I cared about that I was going to get my medication. So, that is sort of those things.

The lab, when I went to see the lab I didn't care about who was the nurse who was going to deal with it and in fact the nurse's details probably would not be in the directory, but the fact that I could go and get a specific lab test done or a radiology that was the important part.

So, I need to make appointments, I need to enter out my forms and I need to be able to find those valuable end-points. So, from an electrical point-of-view I can actually share my discharge summary, I can share my lab results back to the GP, all this stuff can flow through nice and clean.

So, directories are about supporting all of the other health processes that we do. So, yes, directories are everywhere. So, they are at organizational levels, they are at institutional levels. There are all sorts of content in there, there are terminology services. So, when I look in a directory if I go and search on Kaiser's website I can actually find where a pharmacist is and so the terminology that is on there is really friendly for me as a consumer, it just says "a dentist in my area." It doesn't say the specific qualifications that the dentist has, that he is orthodontic surgeon.

So, a lot of these other things coming forward is how do we referrals, rostering, scheduling, care planning, shared care, care teams, service cost and ability these are all things that we experience and they are being done today outside of the standards world in real isolated pockets and consumers are really starting to get involved.

So, I've got this lovely...everyone has these fancy diagrams that keep building and changing, so I'm just going to have just an example of how these sort of directories sort of, I guess, are related to each other.

So, you could look at them as, is this a federation, is this a replication, it really doesn't matter the point is I've got the content and the different levels. So, I've got multiple organizations with directory data and each of those enterprises feed down into sub-organizations, they might be departments within and then on the floor in the hospital or in the facility I've got a bit of software that is actually doing stuff. So, I might have multiple coming down.

And I share content in some cases between the applications so that is pretty cool. And between enterprises so I can share my integration, my discharge summary from one to another and then there is registration bodies and those technical end-points we want to share and then feeding back up again into national directory structures which could include regional structures and the certification bodies.

So, all of these could be independent directories of some sort and I think going forward we are still going to experience that. And I think if you look at it, are we going to collapse everything up into this one big national structure, probably not, I'll still have stuff sitting in my software, I'm going to have local content that is going to be specific just to my organization or my enterprise. So, there are going to be different layers of information that we need to resolve.

So, I'll just recap a little bit on those directory use cases, so a practitioner looking up a known practitioners details, say their Direct address, yes, everyone pretty happy. A system looking up the practitioners end-point details, so the doctor putting the discharge summary, send it off and I don't care how it gets there and that's not physician's problem it's the systems problem to find out where is that end-point and get it through. So, that is a really good thing.

So, a practitioner searching for a practitioner that they do not know. So, I go into my GP and say "I want to go and find...I'm visiting out of state and I need to go and find someone I can see" and so they will set up a new partnership for me to go and deal with because I'm moving towns.

So, a practitioner looking for a service, you want to go and get a radiology test done, so you are not looking for a radiographer you're looking for a lab that does radiography. And then a consumer searching for a service. So, it is a very different use case.

So, there are some services we look for where we do care who the practitioner is or the provider is. There are some things we search for that actually don't matter because of the person who is going to do it might not be registered, they are substitutable, we probably care that they are qualified to do what they are doing, but not necessarily who it is.

And the lucky last one is a consumer searching for availability of a practitioner at a location. So, can I get to the person.

So, fundamentals for success with directories, so we've got to be sure that the content is accurate and that everyone is quite sure of that, is it current, so if I've got a cash copy in my local system when was it put there. The breadth of content, so does it have all the width of that information, do I have enough service end-points, do I have enough detail on availability, do I know is it the right terminology, is it a practitioner friendly value or is it a consumer value, which is relevant to know and can I get at it.

And minimal technology barriers, so, yes, can we get there and securely petitioned data. So, a lot of data, and I've sort of heard from others that there is a lot of sensitive data that are in these directories and the one example I come back to is the facilities address or a practitioner's address, so some services perfectly okay. If I've got a women's shelter, which is for crisis accommodation, the address of that probably is quite sensitive so I don't want to be able to go and search and go "oh, let's pop around there and go and find where"...anyway. So, we want to make sure that it is properly secured.

So, how is this done today? So, we sort of heard a lot about healthcare provider directories, so, yes it's very simple, sorry, if I've misrepresented or downplayed it, but it is typically a standard hierarchy or org chart with locations with nested organizations to bring down that detail and the likes of specialties are really attributes on the practitioners and the organizations so representing a specific service without a practitioner at a location for an availability becomes more challenging I guess is probably the term we would be looking for. So, really how do we deal with non-hierarchical detail.

So, we'll look at, well what is...instead of a provider directory what is the services directory then in comparison. So, it includes locations and services as well as practitioners. So you can get that level of the practitioner working in multiple places and having different attributes at each of those places. So, it really goes into that next level of relationships.

So, which is where I will drill into a practitioner role, so I think everyone recognizes that...so in this example, so a nice Dr. Green works in two emergency facilities, so that is pretty good. Dr. Brown works at one, Northville Pathology, so and Dr. White you can't quite see, but he works at two different facilities there. And so the skills of the practitioner depend on the location as well.

So, if I've got a qualified radiographer who works at two different locations but they've got different equipment at those two locations the services provided can be quite different and so a lot in our situations we've got scarce practitioner resources, so as in actual people, and so they will move around and go between different sites, so, on Monday and Tuesday they'll work out of this facility and on Wednesday, Thursday and Friday they'll work on the west side of town. So, those complex relationships of how do I make an appointment to go and see them, how do I know the availability and then look at, from a systems perspective, they might be two different software systems at those two facilities. So, if I want to send a discharge summary back to the West End Emergency, not the intent of the emergency department, but you really need to know which one of the systems I need to send to. So, those are really practitioner roles.

So, just a bit of a use case, so in the Australian context we've got a National Services Directory which is a single directory, which is curated content, it's got consumer-friendly vocabulary inside as well as clinician-friendly content. It is fully Geo-location aware and it is fully exposed by our APIs. So, everything in that you can ask for over an API. It is an older implementation, it has electronic end-point information and it has been running for about eight years or whatever, so it has been around the tracks for quite a while. So, it grew from a state-based service into a multi-state and then into the national model. So, it has been around for a while and had a few different areas and yet supporting electronic discharge summaries, referrals, lab messaging, getting all that through.

So, just a couple of screenshots so you can actually go and search for particular service types with preferences, so they do bulk billing, do they have wheelchair accessibility, so you get the idea. And just an example of the results that come back, say, yes, it's open now, yes, that's a good thing to know and how far away from me is it.

And I guess directories do exist, we all are aware of it. This one is just from Kaiser, so just doing a pharmacy search so I don't actually see the names of the doctors or pharmacists in this case, so cool.

So, the directory standards that I've been involved with, so the HCSPDir from HL7 actually was evolved out of the work that the Australian NSD was built on. So that was there, that went off to OMG and was turned into the ServD work, which I was a big part of and now it has come back full circle into the FHIR space, so we are looking at actually building on the lessons we learned from there and rolling that into the FHIR spec and getting that much wider adopted.

So, the shortest ever summary of FHIR, so hands up who is heard of FHIR? Everybody, that's fantastic. So, who really knows what FHIR is? Three, no a few more than that. So, it is based on modern web technologies. So, why is that really important? Because it lowers the cost of the developer who has to come in and actually work with the stuff so we can take off the shelf people, we can take off the shelf techniques and build things much more quickly.

It's got a core resource model so those very central resources, so organization, practitioner, location, healthcare service, it has a base resource for all of that sort of stuff and a complete wire format to support that which could be either JSON or XML, so for our new generation guys that really loved building the JSON it is there but for our old school folks, like myself, we can still have our XML documents and use my tools. Thank you.

It does CRUD so for resources I can create, read, update and delete them. I can perform searching, so searching can be simple across one resource, it can be complex across multiple resources, which is really cool. It is extensible. So, I've got to express that and emphasize it is extensible.

So, when I got in touch with Jeff from Michigan, and results equals two, they've done some really cool stuff. They've come up with some really cool stuff that we hadn't tried to do and they've managed to achieve it and they've actually got it running and that is awesome and using extensions and so everyone, so, even my server, so I've got a FHIR server that we are building, I was able to take that content and put it straight into our system without touching it. So, even though they've got all these custom groovy stuff in there it was able to populate in and search and everything was released which was really nice.

Profitable conformance, okay, that's spellcheck, go on, wonderful, it is actually meant to be profitable, but I'll go with that, it's profitable, yeah. No its profiles and conformance. So, just like with the IHE specs they get in and profile out content to say, we don't like you using this it doesn't make any sense but we really want you to use this terminology when you are going to fill in the organization type and we actually need a shoe size for our practitioners because we run a ski school so that's really important so we can profile that in. So, that's great, so there is a FHIR artifact for doing that.

And conformance is basically like in computably test the resources to actually make sure that they have conformed to that profitable profile with any luck. And I guess it natively supports distributed data so it is not just about, oh, I'll shove everything in, it's on the one database, you've got to get in there. So, we support multiple deployment models so it can be just a façade in front of an existing system.

So, the likes of, I don't know if Carl is back there somewhere, yes, there you are, so he has put in a FHIR façade sitting in front of CSD platforms and we've done that to some of our systems as well, putting a FHIR façade in front. And so I look at the work being done in EPIC and Cerner and a lot of the other big vendors and the Argonauts they are putting façades in front of their existing systems so it is really bringing the bar down to make it nicely fit within the space.

And it support REST messaging services and documents. So, it is not just purely REST we can do the messaging. So, when I look at claims it can actually pump through the claims. So, it is more than just a community so that's us...profiling, two parts there, okay, a couple of moments left.

Open test servers are always there, connect-a-thons are big so it is all about testing and getting stuff happening. So, that's the core sort of structure. We note the sort of end-points sort of in gray that is just new or about to happen. Document references, schedules, referrals, care plans, questionnaires, blah, blah, blah, blah.

So, who is doing it, Argonauts, yes, we all know Michigan. So, we are doing it internally in our own company, so, sorry to rush past you...I think I've said enough don't you...so FHIR we want to move to more of the lessons learned...and bring stuff into core and help build on those extra experiences to get in there.

So, FHIR is, I guess in recap, a continuation of lessons everywhere, it's inclusive of service directory data and we are looking to address future needs not just what it is and I guess it's being used by the vendors themselves and we are considering it, certainly as a vendor, as one of the core pieces of our own software, so trying to share that becomes a whole lot easier because I am already using the toolset, I've already got the systems in place and getting there. So, it is a large and growing community and thank you.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

We are running a little behind today, we do have one more demonstration to set up, while Alan is setting up maybe we can entertain one question.

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...the diagram where you showed the...

Brian Postlethwaite – Senior Solutions Architect – Telstra Health

I guess I didn't put it on that diagram, it's definitely in the FHIR model, it was just I guess I had to stop somewhere, so yes it is definitely part of the model.

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Brian Postlethwaite – Senior Solutions Architect – Telstra Health

I think we've gone over the 100 mark and just one last thing to say I guess is back in the September build there was a roundabout I think 1000 examples in the spec, which are all validated. In the build that we've just released there are over 8000 re-validated resources in the spec. So, as far as can you get ahold of seeing examples on how does this stuff look, yes, it's in there.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Great, thank you very much. We have one more speaker today, Alan Viars is going to do a quick demonstration and I want to do a little bit of context setting here, a lot of us here in the room have implementation...talk about some more modern technologies and what Alan has done is take a look at some of the modern technologies that are out there and...questions about what is it that we could do if we were to address things using some of the more modern technologies that we're talking about.

We ought to think about this as perhaps the lowest bar. If I'm not getting here I'm still doing the same old thing, if I want to be more exciting then I need to stretch beyond this point. So, Alan do you want to give...are you set?

Alan Viars, MS – President - Videntity

Thanks, I'm the President of Videntity, there was a typo, I think it said Validity, I'm a Computer Scientist at heart and I'm an aspiring benevolent dictator, you can look up it, a geeky term, I'd say I've worn many hats, I was the HHS external entrepreneur at CMS working on the NPPES modernization, working under Richard Gilbert here in the audience. Currently, I provide software services to CMS, ONC and NIST but I

am not speaking for CMS, ONC or the government in general so just giving my “get of jail free” card up front.

Simple is better than complex, complex is better than complicated and we only get so many trips around the sun so we’d better keep it simple because we do not have a lot of time, just reminding you all you are going to die today. So, yeah, hopefully not today. I guess we’re all dying, right?

So, I’m going to provide a software demonstration that just shows one way of how you could build a provider directory namely about pushing data up so I’m going to start with a business case, let’s just take a State such as North Carolina and let’s imagine that state wants to accept provider data stuff and it might be lots of different things let’s just say the content is not that important right now. So, they want to push this information out, that information needs to be authenticated not just anybody can update the information. This scenario could also apply to CMS but we are just using the state as an example.

And that system is going to also have a series of APIs for reading data or resources to read data, much of that might be public, some of those might be private, but there may be a Direct directory, planned participation directory, addresses, affiliations that sort of thing, as we’ve talked about there are a lot of different definitions for what a provider directory is or could be.

So, before I get into the demo I wanted to talk about three technologies that are used in this demo and the first is a document-oriented architecture and that essentially means XML or JSON and the second is a RESTful API and we’ve heard that a lot today. And the third thing that I don’t think we’ve heard is about OAuth and I’m going to talk about why those three things go together and why those kind of work.

The first thing is a documented-oriented architecture, the main reason that you would want to use XML or JSON is because it’s extensible and you can add things to the document and those documents are machine readable. And I tend to favor JSON over XML just because it is simpler, they call it the “fat free XML” and it is a more compact over the wire. I think it has gotten a lot more popular in the last three years largely because of the rise of JavaScript, so JSON stands for JavaScript Object Notation but it’s important to note that that’s not tied to JavaScript that it can be used in any language, but XML is fine if that’s what you have an investment in we could be transferring that data as well.

RESTful, well, why do people use RESTful APIs? Well, usually one of the reasons is that it is simpler to implement and it tends to not require a particular piece of technology, it can pretty much be implemented in standard with standard web technologies in any language so it is kind of vendor agnostic.

And OAuth, does anyone here not know what OAuth is? Everyone here knows what OAuth is right?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

I don’t believe that.

Alan Viars, MS – President - Videntity

Come on one person raise their hand, okay, okay. So, how many of guys use Tinder? No? Spotify, you’ll admit using Spotify, okay, so you’ve gone to a website where it says login with Facebook, right, and so you don’t...it takes you to Facebook if you are not already logged in it says do you authorize this application, do you...post on your behalf or read your friend list and you authorize that. That is an Internet standard and that is OAuth and Facebook implements it and Twitter, and all over the place. So, that can actually be applied to healthcare.

So, let's talk about this state acting as an OAuth provider and OAuth is mentioned in FHIR as a means to protect FHIR so it's really a good way to protect RESTful APIs. I should also mention that Sarah Squire and Justin Richer are in the crowd here they are your OAuth experts here so you should talk to them if you want sort of deep knowledge and I should mention that CMS is investigating using OAuth for the Blue Button on FHIR Project and so talk to Mark Scrimshire here about that. So, as far as beneficiary access to third-party applications that is not why we're here to talk about today but I thought I would mention that.

And another thing that OAuth is providing is it's more secure than using standard HTTP Auth so let's say our third-party application wants to push data into this provider directory in the sky well they don't have to put the user name and password, store the credentials in their App it prevents needing to add that into your database, it's basically a security protocol, I want to say it's a delegation framework, right, that's the best way to phrase it.

So, okay, this is just sort of a title slide, I'm going to get into the demo here...still getting used to the Mac, I'm a recent convert. Oh, yeah, I just had this up here, but this is the Instagram where if you wanted to register an App...one of the first things you do with OAuth is you have to register the application first and then people use it, just wanted to demonstrate that you can do that in Instagram it kind of works the same way.

We already have an OAuth server here set up where an application is registered, it's called "sample" and the client ID and client secret are added to the third-party applications that could be an EHR or an EMR and in this particular implementation we're specifying what particular URLs that the application that someone is writing has access to and in our particular application there is a FHIR URL but it doesn't have to be, but in this case they're all FHIR or I'm sorry they're all RESTful APIs.

So, I'm going to log out of this. So, that's all been set up already I can't demonstrate that very quickly and I'm just going to login to this client application, I'm just going to do a login and this is probably a very familiar flow it's going to ask me to log into the server and it's going to ask me if I want to give authorization for these things, I do, and let's say I want to actually just push in a practitioner FHIR resource, so I have one of those here and, yes, it looks...and this is kind of a raw example of course a human wouldn't want to paste a JSON document most of the time, but you get the idea, you would normally have a UI behind this, this is just to demonstrate the idea and that document has invalid...oh, wow, what did I do? Okay, well, I'm not going to show that one, I'll show the other one.

Trust me I'll show you that tomorrow. Anybody that wants to see a deeper dive of this I'm more than happy to provide it to you. I've somehow put a typo in the JSON document so it is not accepting it. So, that's the error checking working. It is, it is.

Okay, so here's an example of provider JSON, so provider JSON is essentially what we used in the NPPES modernization, it essentially has the NPPES data in a single JSON document so each provider or organization is a document has all the NPI data stuff in it and, oh, let me grab not the FHIR document but a...I'll just post this one in, I didn't post that in twice, did I? Oh, man, there. I'm sorry, I have put a typo in here somewhere and I don't know where. I just did this five minutes ago. I'm going to have to come back to that.

But anyhow, basically you post this data in and it says the document is saved, so I'll be glad to show that to anyone tomorrow. I have obviously put a typo here, but let me show you how in this particular situation we have our NPPES data lined up here, this is basically like the read only version of the NPPES data that you may be familiar with and you can pass in and do searches on this, but in this same system we also have the PECOS data and we have the qualified health plan API, essentially planned provider

directories all stored essentially on one server they are just different URLs serving out JSON documents that have different data so it does not have to be an either/or it can be a both/and.

Here is an example of the FHIR data. So, you can have the data in this provider JSON format or a FHIR format and all of those things could potentially be supported. Now here is something that might be particularly useful to people that work in the Medicaid crowd is what I added in here, this is an example of the NPI registry it is not the CMS version it is kind of a fork of that, but I'm going to do a search here, do I have any data in here...I'll just say...well, basically the point is you can type in an NPI number and if you get a result back against this PECOS data now that the PECOS data has been released and a lot of people may not know that you can know if a provider is a Medicare provider that can be very useful to a Medicaid provider because you may want to fast-track that person in your own Medicaid work. So, if I put somebody else in here I get no results. I know that they are not a Medicaid provider. So that is also a simple API.

So, that's about all that I wanted to show except that I wanted to tell you that all this stuff is open source and these are links and I'll be sure and provide these to you so these can go on the website and these are all linked to all the source codes that is used to feed this demonstration. So, anybody have any questions?

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Are there any questions for Alan?

Alan Viars, MS – President - Videntity

It is late.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

It is late people are tired. So, we will get this information up on the website for people so that you can find it and take a look at things yourself later on. And if there aren't any questions than thank you very much Alan.

Alan Viars, MS – President - Videntity

Thanks.

M

...

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Pardon, oh, do you have one? Please, go ahead.

M

OAuth...in that OAuth scenario is Instagram or Facebook, etcetera aware of the user's credentials?

Alan Viars, MS – President - Videntity

...

Sarah

Yes...

Justin Richer, MS –Independent Contractor, Founder – Bespoke Engineering, LLC.

Right so, exactly so to echo what Sarah is saying, for the person online who asked the question who can't hear you without the mic. So, Facebook or Instagram in most cases are the authorization server, they are the ones that authenticate the user. So, they do have an awareness of the user's credentials.

The clients that are accessing Instagram or Facebook, or Spotify, or any of these other systems do not have access to the user's credentials and that's a very, very key part of the OAuth process. So, I would suggest looking up if you can find a diagram of the different parties in an OAuth system and there are four main rules there and every rule plays a very specific part in the OAuth process.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Thanks, can you say your name.

Justin Richer, MS –Independent Contractor, Founder – Bespoke Engineering, LLC.

Sorry, Justin Richer.

Alan Viars, MS – President - Videntity

Oh, and Justin wrote the MITRE ID connect OAuth, OpenID Connect implementation, by the way I did get this to work there was a typo the quotes were the wrong kind of quotes but basically that pushed that data into NPPES you can do the same thing with a FHIR resource, you could serve the data out in both forms. It does not have to be a particular form. Sure, you have one more question?

W

...Facebook doesn't...they give you a credential but they didn't ID proof you and that's the distinction between some of the other identity things correct?

W

OAuth...

W

Yes, exactly.

Multiple voices

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges

Separate problem.

W

OAuth has the...identity proofing was the answer and then the...

M

...

W

Right.

Alan Viars, MS – President - Videntity

It is just saying yes or no.

W
Right.

Alan Viars, MS – President - Videntity

But so that's a separate process. So, somebody has to log in and maybe that is...three factor authentication maybe it is just a user name and password but at some point they log in and then they give authorization. Now that could be just for a state level application doing that and performing a bulk upload or it could be for an individual giving access to uploading their information kind of...and that's more of the Facebook scenario.

And I guess one of the things that I didn't really dive into here is in this particular OAuth 2 server implementation is we're saying, well, when you create an application with Instagram they don't say "you can do this and you can do that" it is sort of like you can do whatever, but in our scenario we can say "well, we want to allow this organization to be able to do these things and we want to allow this organization over here to hit these other APIs." Do you see what I'm saying? So, it sort of trying to create a protected capability situation that would be repeatable.

W
And the other question I had was just what was the third dataset that was up there, because the slide changed before I could write it down? So you had four datasets that you were using in your example. What was the third dataset?

Alan Viars, MS – President - Videntity

Third dataset?

W
In your example.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges
NPPES, PECOS.

W
Yes it was a health plan but I...

Alan Viars, MS – President - Videntity

Oh, oh, that was an example of the qualified health plan, if you look at GitHub.com/CMS.gov you'll see examples of qualified health plans where they are defining what a JSON document would look like to represent what a plan would look like. So, imagine, this plan ID with all of these NPIs, right, and that's a different kind of provider directory.

So, I was just illustrating that you could potentially have one Uber provider directory that essentially one website that would have lots of different kinds of slices and dices of different types of provider data in a single place and by the way you could have...we could have had an upload of an LDS file or some other...I just gave two examples provider JSON and FHIR.

Robert Cothren, PhD, MS, SB – Executive Director – A Cunning Plan, California Association of Health Information Exchanges
All right, thank you, everyone.